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September 18, 2015

TO: Commissioners and Interested Parties

FROM: Dr. Charles Lester, Executive Director
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Consistency Division

SUBJECT: Review of and Possible Commission Action on 2016 and 2017 Two-Year
Work Program and Budget for the San Onofre Nuclear Generating Station
(SONGS) Mitigation Independent Monitoring Program

SUMMARY

The staff is recommending Commission approval of a two-year work program and \$5,844,930 two-year budget paid by Southern California Edison for the independent monitoring and technical oversight of the San Onofre Nuclear Generating Station (SONGS) mitigation projects. The mitigation projects and the permittee funded independent monitoring are required under Southern California Edison Company's coastal development permit (No. 6-81-330-A, formerly 183-73). The staff is also recommending Commission approval of a \$237,904 contingency fund to be used for the independent monitoring, in consultation with SCE, if needed.

The permit conditions originally were adopted by the Commission in 1991 to mitigate the adverse impacts of the operation of SONGS Units 2 and 3 on the marine environment. The conditions require SCE and its partners to: (1) create or substantially restore a minimum of 150 acres of southern California wetlands (Condition A), (2) install fish barrier devices to reduce the biomass of fish killed inside the power plant (Condition B), and (3) construct an artificial reef large enough to sustain 150 acres of medium to high density kelp bed community together with funding for a mariculture/marine fish hatchery (Condition C). The conditions also require SCE to provide the funds necessary for technical oversight and independent monitoring of the mitigation projects, to be carried out by independent contract scientists under the direction of the Executive Director (Condition D). Implementation of the mitigation projects is the responsibility of SCE whereas the Commission is responsible for overseeing the independent monitoring and technical oversight function. The independent monitoring and oversight also includes periodic public review of the performance of the mitigation projects.

The field independent monitoring program is carried out through a contract with the University of California, Santa Barbara. Under this contract monitoring data is collected by university contract biologists under the direction of three Principal Scientists that serve as project managers for the monitoring effort (collectively known as “contract scientists”). Southern California Edison also provides funds for a science advisory panel to provide independent scientific expertise to the Commission and to the Principal Scientists.

Work Program for 2016 and 2017

The two principal components of the mitigation project, the wetland and the reef, are progressing on slightly different timelines. The Commission approved the CDP for the San Dieguito wetland restoration project on October 12, 2005 (CDP #6-04-88). Construction began in August 2006 and was completed in fall 2011 with inlet dredging. During the 2014-2015 work period, the contract scientists implemented the third and fourth year of independent performance monitoring to evaluate whether the wetland restoration met the standards set forth in the SONGS permit. In 2016 and 2017, independent performance monitoring will continue.

After construction and monitoring of an experimental reef, the Commission approved the coastal development permit and final reef mitigation plan on February 6, 2008 (CDP #E-07-010). Construction of the artificial reef was completed in September 2008, and on January 27, 2009, the Executive Director determined that the constructed reef met the Final Design Plan specifications in the SONGS permit. During the 2014-2015 work periods, contract scientists conducted performance monitoring on the mitigation reef. Reef tasks for the 2016 and 2017 work period will continue with the eighth and ninth year of post-construction performance monitoring.

Budget for 2016 and 2017

The proposed budget for calendar years 2016 and 2017 covers the independent monitoring and technical oversight program costs for the independent contract scientists, science advisory panel, consultants, administrative support, and operating expense. The proposed staff is the minimum needed to meet the goals specified by the permit under Condition D and to complete the tasks identified in the 2016-2017 work program. The proposed funding totals \$5,844,930 for the two years. Coastal Commission staff also is proposing pre-approved contingency funds in the amount of \$237,904 specifically for potential additional costs for: (1) the Scientific Advisory Panel, (2) early office lease termination, and (3) unexpected repair and/or replacement of field vehicles and outboard engines.

SCE has indicated its satisfaction with the proposed Commission oversight and independent monitoring work plan and budget for the wetland, reef and fish behavioral mitigation for 2016-2017. Staff recommends that the Commission approve the 2016-2017 Work Program and Budget for the independent monitoring and technical oversight of the San Onofre Nuclear Generating Station (SONGS) mitigation projects.

The Coastal Commission staff and the contract scientists will provide an in-depth report on the status of the SONGS Mitigation Program for the Commission at the October 2015 meeting.

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I. MOTION AND RESOLUTION

Commission approval of the 2016 and 2017 two-year Work Program and Budget requires the following motion:

I hereby move that the Commission approve the 2016 and 2017 two-year SONGS Work Program and Budget and contingency fund as recommended by the staff.

The staff recommends a “yes” vote on the foregoing motion, which will result in the adoption by the Commission of the following resolution:

The Commission hereby determines that the 2016 and 2017 two-year SONGS Work Program and Budget and contingency fund that is set forth in the staff recommendation, dated September 18, 2015, carries out the intent of Condition D of Permit 6-81-330-A (formerly 183-73) by requiring the permittee to provide reasonable and necessary funding for the Commission contract scientists’ technical oversight and independent monitoring responsibilities pursuant to the mitigation and lost resource compensation conditions (A through C).

II. FINDINGS AND DECLARATIONS

A. SONGS PERMIT BACKGROUND

In 1974, the California Coastal Zone Conservation Commission issued a permit (No. 6-81-330-A, formerly 183-73) to Southern California Edison Company for Units 2 and 3 of the San Onofre Nuclear Generating Station (SONGS). A condition of the permit required study by the Marine Review Committee of the impacts of the operation of Units 2 and 3 on the marine environment offshore from San Onofre, and mitigation of any adverse impacts.

As a result of the Marine Review Committee’s impact studies, in 1991 the Coastal Commission added new conditions to mitigate the adverse impacts of the power plant on the marine environment which require the permittee to: (1) create or substantially restore at least 150 acres of southern California wetlands (Condition A), (2) install fish barrier devices to reduce the biomass of fish killed inside the power plant (Condition B), and (3) construct a 300-acre kelp reef (Condition C). The conditions specify both physical and biological performance standards for the wetland restoration and kelp reef, and require continuing monitoring of the effectiveness of the fish barriers. The 1991 conditions also require SCE to provide the funds necessary for Commission contract scientific staff technical oversight and independent monitoring of the mitigation projects (Condition D). Monitoring, management and remediation, if needed, are required to be conducted over the “full operating life” of SONGS, defined as past and future years of operation of SONGS Units 2 and 3, including the decommissioning period to the extent that there are continuing discharges.

Operation of Units 2 and 3 began in 1983 and 1984, respectively. Both reactors were shut down in January 2012 due to excessive wear in the cooling tubes of the steam generators, and permanently retired in June 2013. Although Units 2 and 3 have been permanently shut down, SONGS still circulates ocean water within the plant to cool the spent fuel, and thus continues to discharge cooling water. Thus the number of years of mitigation credit that the SONGS mitigation project must obtain to fulfill the requirements of the SONGS CDP is 30 years and

counting. In 1993, the Commission added a requirement for the permittee to partially fund construction of an experimental white sea bass hatchery. Due to its experimental nature, the Commission did not assign mitigation credit to the hatchery requirement.

After extensive review of new kelp impact studies, in April 1997 the Commission approved amended conditions which: (1) reaffirm the Commission's prior decision that San Dieguito is the site that best meets the permit's standards and objectives for wetland restoration, (2) allow up to 35 acres credit for enhancement of wetland habitat at San Dieguito Lagoon by keeping the river mouth permanently open, and (3) revise the kelp mitigation requirements in Condition C. Specifically, the revised Condition C requires construction of an artificial reef large enough to sustain 150 acres of medium to high density kelp bed community that supports 28 tons of reef associated fish (which could result in a reef larger than 150 acres) together with funding for a mariculture/marine fish hatchery as compensation for the loss of 179 acres of medium to high density kelp bed community resulting from the operation of SONGS Units 2 and 3. The artificial reef is to consist of an experimental reef of at least 16.8 acres and a larger mitigation reef to meet the 150-acre kelp bed and 28 ton fish standing stock requirements. The purpose of the experimental reef is to determine which combinations of substrate type and substrate coverage will most likely achieve the performance standards specified in the permit. The design of the mitigation reef will be contingent on the results of the experimental reef.

The Commission also found in April 1997 that there is continuing importance for the independent monitoring and technical oversight required in Condition D to ensure full mitigation under the permit.

B. COMMISSION OVERSIGHT AND INDEPENDENT MONITORING

Condition D of the permit establishes the administrative structure for SCE to fund the independent monitoring and technical oversight of the mitigation projects. It specifically: (1) enables the Commission to retain contract scientists and technical staff to assist the Commission in carrying out its oversight and monitoring functions, (2) provides for a scientific advisory panel to advise the Commission on the design, implementation, monitoring, and remediation of the mitigation projects, (3) assigns financial responsibility for the Commission's oversight and monitoring functions to the permittee and sets forth associated administrative guidelines, and (4) provides for periodic public review of the performance of the mitigation projects.

Condition D requires SCE to fund the Commission's oversight of the mitigation and independent monitoring functions identified in and required by Conditions A through C. The permittee is required to provide "reasonable and necessary costs" for the Commission to retain personnel with appropriate scientific or technical training and skills, as well as reasonable funding for necessary support personnel, equipment, overhead, consultants, the retention of contractors needed to conduct identified studies, and to defray the costs of members of any scientific advisory panel convened by the Executive Director to provide advice on the design, implementation, monitoring and remediation of the mitigation projects.

Pursuant to this condition, the Commission has operated under approved work programs and budgets since 1993. The funds for the oversight and monitoring program are paid fully by SCE and are managed by an independent accounting firm. The Commission retains a science advisory panel under contract to provide scientific expertise to the Commission, contract staff scientists to manage and operate the monitoring program and administrative support personnel to manage

administrative tasks. In addition, independent consultants and contractors are called upon when specific expertise or assistance is needed for specific tasks. The Commission's permanent staff also spends a portion of their time on this program, but except for direct travel reimbursements, their costs are paid by the Commission and are not included in the monitoring program budget.

In approving the work programs and budgets for the monitoring and oversight program, the Commission has authorized an implementation structure through a contract with the University of California, Santa Barbara that utilizes the existing contract scientists as project managers at no additional cost, with data collection done by university contract staff biologists under their direction. The Commission found, based on a comparison of estimated costs from UCSB, other universities, and private consultants, that this implementation structure is the most efficient, cost-effective, scientifically rigorous, and timely method of achieving the goals of the independent monitoring required by the permit. This implementation structure will continue during the two-year period of the 2016 and 2017 work program.

C. STATUS OF MITIGATION PROGRAM

1. Status of Wetland Restoration Mitigation

Mitigation Requirement

Condition A of the permit requires the permittee to create or substantially restore a minimum of 150 acres of wetlands to mitigate for the reduction in the standing stocks of nearshore fishes caused by the operation of SONGS Units 2 and 3. In April 1997, the Commission revised Condition A to allow the permittee to meet its 150-acre requirement by receiving up to 35 acres enhancement credit for the permittee's permanent, continuous tidal maintenance at San Dieguito Lagoon.

Wetland Restoration Planning and Environmental Review

In June 1992, following an evaluation of eight sites, the Commission approved SCE's selected restoration site, the San Dieguito River Valley. In April 1997, the Commission reaffirmed its prior decision that San Dieguito River Valley is the restoration site that meets the minimum standards and best meets the objectives set forth in Condition A.

In November 1997, the Commission approved SCE's preliminary wetland restoration plan as largely conforming with the minimum standards and objectives stated in the permit. The CEQA/NEPA environmental review incorporated the mitigation project into the overall San Dieguito River Valley Regional Open Space Park project. The lead agencies for the CEQA/NEPA environmental review were the San Dieguito River Valley Regional Open Space Park Joint Powers Authority (JPA) and the U.S. Fish and Wildlife Service, respectively.

Following the review period on the January 2000 Draft EIR/EIS, the JPA certified the Final EIR/EIS on September 15, 2000, after public hearing. The EIR/EIS designated the Mixed Habitat plan as the environmentally preferred alternative.

Lawsuits challenging the adequacy of the Final EIR/EIS were filed in 2001, but the courts ultimately ruled in 2003 that the EIR/EIS was sufficient. Following the conclusion of the litigation, the USFWS issued its final Record of Decision on the Final EIR/EIS on November 28, 2003.

Steps in Implementing Wetland Restoration

Upon completion of the wetland restoration project design and engineering plans, SCE and JPA submitted their Coastal Development Permit Application (#6-04-88) in August 2004 to receive authority to carry out the restoration project. The Commission's contract scientists and staff reviewed the application and associated documents, requesting additional information where necessary. On October 12, 2005, the Commission approved the Final Restoration Plan and CDP #6-04-88, as conditioned, for the San Dieguito Wetland Restoration Project. (See Exhibits 1 and 2.)

In approving the preliminary restoration plan in 1997, the Commission acknowledged and accepted that a small amount of existing wetland could be lost in implementing the overall wetland restoration project at San Dieguito. The Commission had determined that if the Final Plan involves any loss of wetlands, then such loss would be mitigated and an amendment to the SONGS permit would be considered to allow the restoration project to go forward in compliance with the SONGS permit conditions. Thus, on October 12, 2005, the Commission also approved an amendment to SONGS CDP #6-81-330-A4 to revise Standard 1.3.h of Condition A to allow the minimal loss of existing wetlands as "specifically authorized by the Coastal Commission in Coastal Development Permit No. 6-04-88 for the San Dieguito Wetland Restoration Project Final Restoration Plan."

At the same time, the long-standing obligation of the 22nd Agricultural District to provide for Least Tern nesting habitat as a requirement of its Coastal Development Permit No. 6-84-525 was resolved with the inclusion of four new nesting sites in the Final Restoration Plan. On October 12, 2005, the Commission approved an amendment to CDP #6-84-525 to require the provision, maintenance and monitoring of the new Least Tern nesting habitat to be constructed as part of the San Dieguito Wetland Restoration Project.

Wetland Restoration Condition Compliance

Following the Commission's approval of CDP #6-04-88, SCE and JPA began preparing the final plans in compliance with the special conditions in CDP #6-04-88 that must be met prior to issuance of the permit, prior to commencement of construction, during construction, at the completion of construction, and on an on-going basis. Materials submitted in compliance with the special conditions were reviewed by the Executive Director and found to fulfill certain requirements of those conditions. Two additional condition compliance items were reviewed and accepted by the Executive Director after the 2011 Work Program Update.

- On December 20, 2011, Commission staff issued the Notice of Acceptance for condition compliance required for the JPA Mitigation Program for Trail and Treatment Pond Impacts. The potential to restore additional acreage within the San Dieguito restoration site as proposed by other parties had delayed a portion of the JPA's mitigation program and required consideration of alternative mitigation sites. A material amendment was approved in September 2011 to address these changes (see Amendment 10).
- On January 26, 2012, Commission staff issued the Notice of Acceptance for condition compliance required for final construction information for Least Tern Nesting Sites.

See Appendix A for a complete list of previous specific condition compliance dates.

In April 2011 the Executive Director convened the initial meeting and site visit of the Coastal Processes Technical Panel to assist with the Beach Monitoring Program required under Special Condition #25. SCE submitted a summary report of beach surveys to the panel prior to the meeting, including historical and recent data for the beach monitoring sites designated in the SONGS permit. SCE continues to submit quarterly reports to the Coastal Processes Technical Panel and to post them on the San Dieguito Project web site. The CPT Panel has reviewed these reports and has not raised any issues of concern. The quarterly reports have continued and the monitoring has not reached any of the triggers or raised issues of concern for the CPT Panel; thus there have been no follow-up meetings of the CPT.

A sediment budget analysis, localized for the San Dieguito area, has been under preparation for several years. The CPT Panel members will be provided the localized sediment budget once it is completed (the most current schedule calls for completion in Fall 2015). Following completion of the localized sediment budget, the CPT Panel will convene, either by conference call or through an in-person meeting, to discuss the ramifications to this new study to the Beach Monitoring Program and Special Condition #25. Given the current tracking of El Niño-like conditions in the eastern Pacific, scheduling for an in-person CPT Panel meeting may be started if any quarterly survey identifies issues of potential concern, as identified in Special Condition #25, so that the Panel can respond quickly should a second survey trigger rapid response.

Wetland CDP Amendments

The following permit amendments have been submitted:

1. On August 24, 2006, the Commission issued an immaterial amendment to modify the language of special condition #4 with regard to the timing of submittal of final plans for berm and slope protection. Originally, the condition required such plans be submitted “prior to issuance of the coastal development permit.” This immaterial amendment changed the timing of the submittal to “prior to commencement of construction of the revetment located on the south side of the river east of Jimmy Durante Boulevard.”
2. On July 10, 2007, the Commission approved an amendment to include in the wetland restoration project the removal of the berm north/northeast of the Grand Avenue Bridge.
3. On August 20, 2007, SCE withdrew an amendment request to build a temporary river crossing.
4. On August 14, 2007, SCE submitted an amendment request to address several changes in the Final Restoration Plan, including changes to restoration module W45, exclusion of the riverbank revetment, and an alternative South Beach access plan. This amendment was revised in September 2009, and on June 9, 2010, the Commission approved an amendment to replace restoration module W45 with module W16, modify the timing of construction of public beach accessways, and modify the riverbend revetment requirements in Special Condition #4.
5. On October 25, 2007, the Commission issued an immaterial amendment to modify special condition #8 regarding the mitigation plan for impacts from construction of the trail and wetland treatment ponds.
6. On February 28, 2008, the Commission issued an immaterial amendment to modify the trail crossing under Interstate 5 from open bottom box culverts to bridges.

7. On October 13, 2009, the Commission issued an immaterial amendment to modify segment 8 of the Coast to Crest trail to designate a pedestrian-only path along an existing erosion-control stability bench on the slope of disposal site 32. The pedestrian-only segment would be in addition to and would connect with segment 8 to form a loop trail.
8. On November 19, 2010, the Commission issued an immaterial amendment to modify designated mitigation sites for creation of coastal sage scrub as required by Special Condition #8 regarding trail and treatment ponds.
9. On July 20, 2011, the Commission issued an immaterial amendment to modify the timing restriction on the staging area at North Beach to allow staging of construction equipment associated with dredging activities to begin immediately after Labor Day.
10. On September 21, 2011, the Commission issued a material amendment to: (1) add the Mesa Loop Trail to the project, and (2) modify Special Condition #8 to allow integration of 2.736 acres tidal or seasonal salt marsh mitigation into the SANDAG proposed restoration, with a back-up plan for restoration of 2.736 acres of seasonal high marsh adjacent to El Camino Real on JPA property.
11. On September 12, 2012, the Commission issued an immaterial amendment to modify the permanent access roads within the lagoon system by: (1) eliminating a maintenance access point from the end of Race Track Drive, (2) converting an internal construction road from temporary to permanent, and (3) converting access to the maintenance road system from El Camino from temporary to permanent.

Wetland Restoration Construction and Construction Monitoring

Construction of the wetland restoration project at San Dieguito (Exhibit 2) commenced in August 2006 and was completed on September 29, 2011, with the completion of the inlet opening. Construction of the large subtidal and intertidal basin (44 acres) in Area 2A (Module W1) west of Interstate 5 commenced in December 2006 and was completed with opening to tidal exchange on January 23, 2008. Excavation and grading to create middle and high marsh in Area 2A (Modules W2, W2A, and W3) adjacent to the San Dieguito River was begun in April 2007 and completed in January 2008.

In April 2007, construction of wetland habitat commenced in other areas within the restoration site. This included modules on the east side of Interstate 5, both north (Area 3) and south (Area 2B) of the San Dieguito River that are primarily high and middle salt marsh and exposed mud flat habitat. Tidal flushing to the restoration site was enhanced through a partial dredging of the inlet on May 7, 2008. Excavation and grading, including the construction of tidal creek networks, was completed in Area 3 (Modules W4, W16) and these areas were opened to tidal exchange on December 3, 2008. Excavation and grading of Area 2B (Modules W5, W10) was also completed in December 2008. Material excavated from the construction site was deposited in upland disposal sites within the project area. Berms that will constrain storm runoff were completed along the boundary of the effective flow area of the San Dieguito River.

Disposal Sites and Berms. The disposal sites and berms were covered with topsoil and hydroseeded in December 2007 and October 2008 to control erosion. The results of the hydroseeding were mixed. Initially, the hydroseed applications were not successful in producing native vegetation and the berm slopes and disposal sites became covered with weeds. However, a program of intensive hand weeding of the berm slopes during summer 2010 proved beneficial

and much of Berm 8, bordering the south side of modules W4/W16 and portions of Berm 9 bordering the south side of W2/W3 are now covered with native plants (goldenbush, saltbush, buckwheat, and sand aster). SCE has committed to weeding and the application of hydroseed to bare areas as necessary in order to achieve the City of San Diego requirement for native plant cover on berms and disposal sites.

Vegetation. Following excavation and grading, portions of the restoration project were planted with salt marsh vegetation. Planting of selected species (largely pickleweed) in high marsh habitat occurred in January/February 2009. The performance of these plantings varied among modules with the best survival and growth occurring in W4/W16, whereas plantings failed to survive in W2/W3. Some natural recruitment of pickleweed has occurred in all modules. Discussions between Commission staff, contract scientists, and SCE regarding the failure of these plantings and the patchiness of natural plant establishment lead to the construction of tidal networks and re-grading of some areas of W2/W3 in November 2010 to better convey tidal waters throughout these modules. Plant establishment improved in areas adjacent to the tidal creeks, but remained sparse at higher elevations that received infrequent tidal inundation. Further discussions between Commission staff, contract scientists, and SCE lead to the re-grading of W2/W3 in March 2014 to lower tidal elevations with more slope to improve the drainage of tidal waters. Natural recruitment of pickleweed was observed in the re-graded areas in spring 2015, and has continued to expand since then. Based on observations of colonization adjacent to the tidal creeks, we expect the continued development of salt marsh vegetation over the next few years.

Pacific cordgrass, a native low marsh plant, provides habitat for the endangered Light-footed clapper rail (recently re-named the Ridgeway Rail) and other bird species. Cordgrass (1200 individuals) was planted in November 2008 and April 2009 with a larger planting (19,450 individuals) in November 2011. A total of 33,322 cordgrass individuals were counted within the project area in May 2012. Some of these individuals also appear to have recruited naturally from seed. Currently, stands of cordgrass are present along the margins of the restored basin (W1) and modules W4/W16. These results are encouraging and suggest that cordgrass will become well established in low marsh habitat throughout the wetland.

Wetland Acreage and Topography. The SONGS permit required independent monitoring by Commission contract scientists to ensure that the restoration work was conducted according to approved plans. To accomplish this task, CCC contract scientists established good communication with SCE and its partners involved with implementation of the Final Plan and a frequent on-site presence at the restoration site. CCC contract scientists monitored construction activities through attendance at briefings, discussions with SCE and its consultants, and field inspections of work in progress to ensure the wetland was constructed according to the approved Final Plan. These inspections included verifying module boundaries and elevations, habitat areas, and the appropriate tidal regime. CCC contract scientist surveys indicated that SCE met the acreage requirement of 150 acres of tidally influenced habitat in 2013 and 2014.

CCC contract scientists also monitored the impacts of unplanned construction activities. Unplanned construction changes have caused impacts to existing habitat through changes in the alignment of a haul road, and unforeseen impacts of a disposal site and berm on wetland habitat. Staff administered these changes through condition compliance, where appropriate, and through permit amendments as needed. CCC contract scientists are working cooperatively with SCE consultants in assessing the suitability of constructed transition habitat for mitigating the

project's permanent impacts to seasonal wetland, and in resolving issues that affect the ability of the wetland to meet the performance standards outlined in the SONGS permit. SCE and its construction team have been very responsive to the requirements of the permit.

Monitoring Plan and Adaptive Management

Condition A of the SONGS permit requires that monitoring of the wetland restoration be done for a period of time equivalent to the full operating life of SONGS Units 2 and 3. This monitoring will be done to measure compliance of the mitigation project with the performance standards specified in the SONGS permit. In accordance with Condition D (Administrative Structure) of the permit, contract scientists retained by the Executive Director developed the Monitoring Plan to guide the monitoring work and are overseeing the monitoring studies outlined in the Plan. The SONGS permit provides a description of the performance standards and monitoring required for the wetland mitigation project. A Draft Monitoring Plan for the SONGS Wetland Mitigation Program was reviewed by State and Federal agencies and SCE in May 2005. A revised Monitoring Plan was part of the coastal development permit (No. 6-04-88) for the wetland restoration project and was considered and approved by the Commission on October 12, 2005. The Monitoring Plan was most recently updated in July 2014 and will continue to be refined in 2016 as more information becomes available pertaining to the logistics of sampling and methods of evaluating the performance standards and the use of transitional habitat to mitigate project permanent impacts to seasonal wetland during construction.

The Monitoring Plan for the SONGS Wetland Mitigation Program closely adheres to the monitoring requirements of the SONGS permit and includes a description of each performance standard and the methods that will be used to determine whether the various performance standards have been met. The performance standards that are being used to measure the success of the wetland restoration project fall into two categories. Absolute standards are evaluated only in San Dieguito Lagoon and pertain to topography, tidal prism, habitat areas, reproductive success of salt marsh plants, and exotic species. Relative standards require that the value of the variable of interest be similar to that measured in reference wetlands in the region. The relative standards pertain to water quality (i.e., oxygen concentration), biological communities (i.e., fish, invertebrates, and birds), salt marsh vegetation, *Spartina* canopy architecture, and food chain support functions. The successful achievement of the relative performance standards will be measured in comparison to three reference wetlands, which are specified in the SONGS permit to be: (1) relatively undisturbed, (2) natural tidal wetlands, and (3) within the Southern Bight. The wetlands that best met these three criteria and that were selected as reference sites are Tijuana River Estuary, Mugu Lagoon, and Carpinteria Salt Marsh.

Management issues relevant to the SONGS wetland mitigation requirement are also discussed in the Monitoring Plan. These issues include inlet maintenance, excessive changes in topography, and exotic species. Although the Commission's contract scientists are not responsible for managing the wetland restoration, their monitoring will measure several parameters that can be used in adaptive management to ensure the success of the restoration project.

The SONGS permit requires SCE to develop and implement a plan for managing the inlet in perpetuity to ensure uninterrupted tidal flushing of the restored wetland. This plan, initially submitted to CCC staff on March 30, 2006, revised and finally accepted by the Executive Director on January 27, 2011, provides conditions that would indicate the need for additional maintenance dredging at the inlet. Commission contract scientists are measuring water elevation,

tidal exchange, salinity, and dissolved oxygen concentration in the wetland during their evaluation of the water quality performance standard. These variables change dramatically with a reduction in tidal flushing and provide a useful trigger for inlet maintenance. Monitoring by CCC contract scientists found no evidence of reduced tidal flushing or degradation of water quality. However, monitoring by SCE contractors found increasing movement of beach sand into the inlet and as a result have scheduled dredging of the inlet for October of 2015.

Wetland Performance Monitoring

Construction of the wetland habitats in San Dieguito Lagoon was completed in 2011 and annual post-construction monitoring to evaluate whether the restoration meets the performance criteria identified in Condition A began in January 2012. The success of the San Dieguito Wetlands in meeting the mitigation requirement for a given year is based on its ability to meet the physical and biological performance standards contained in the SONGS Permit. In 2013 and 2014, the San Dieguito Wetlands Restoration Project satisfied four of the five absolute standards, which pertained to topography, tidal prism, plant reproductive success, and exotic species. The project did not meet the habitat areas standard in either year. This standard requires that habitat areas in the Restoration be within 10% of the areas provided in the Final Plan. The restoration met 11 of the 15 relative standards in 2013 and 10 of the 15 relative standards in 2014. The relative standards that were met in both years pertained to water quality, the densities and number of species of fish and birds, *Spartina* canopy architecture, and food chain support. The relative standards that were not met in both years pertained to the cover of salt marsh vegetation cover and the abundance and number of species of macro-invertebrates. The standard for the percent cover of algae was met in 2013, but not in 2014. The slow development of vegetation in modules W2/3 is largely responsible for the failure of the restored wetland to meet the vegetation standard. The reason for the slow development of macro-invertebrates is unknown at present, but more time may be required for macro-invertebrates to become established. It is very promising that *Spartina* is becoming established, and robust patches are currently present throughout portions of the restoration site. Conditions in the San Dieguito Wetland that will warrant close observation during 2016 and 2017 include macro-invertebrate density and species richness, and development of salt marsh vegetation cover at high elevations. Results from 2012-2014 monitoring were presented at an annual public review workshop held on May 11, 2015 in the City of Del Mar and are posted on UCSB's SONGS mitigation monitoring website (<http://marinemitigation.msi.ucsb.edu>).

2. Status of Kelp Reef Mitigation

Mitigation Requirement

Condition C of the permit requires construction of an artificial reef that consists of an experimental reef and a larger mitigation reef. The experimental reef must be a minimum of 16.8 acres and the mitigation reef must be of sufficient size to sustain 150 acres of medium to high density kelp bed community with a standing stock of reef fish that is at least 28 US tons. The purpose of the experimental reef is to determine which combinations of substrate type and substrate coverage will most likely achieve the performance standards specified in the permit. The design of the mitigation reef is contingent on the results of the experimental reef.

In April 1997, the Commission added the requirement for a payment of \$3.6 million to the State's Ocean Resource Enhancement and Hatchery Program (OREHP) to fund a mariculture / marine fish hatchery to provide compensation for resources not replaced by the artificial mitigation reef. The Commission had earlier required, in 1993, SCE to contribute \$1.2 million toward construction of an experimental white sea bass fish hatchery. SCE has fully satisfied these requirements; thus, there are no fish hatchery tasks conducted by Commission contract scientists or funded through the Commission's monitoring and oversight program. Permanent Commission staff provides oversight of the California Department of Fish and Wildlife's continuing fish hatchery program.

Planning and Construction of Experimental Reef

Following the Commission's approval of the SONGS permit amendments in April 1997, the permittee submitted a preliminary conceptual plan for the experimental reef in June 1997, which was approved by the Executive Director and forwarded to state and federal agencies for review. As lead agency, the State Lands Commission (SLC) determined that under the requirements of CEQA a Programmatic Environmental Impact Report (PEIR) should be prepared to evaluate both the experimental reef and the subsequent full mitigation reef. SLC began the environmental review process in March 1998, and certified the final PEIR and issued the offshore lease for the experimental reef on June 14, 1999.

The Coastal Commission approved the coastal development permit for the experimental reef on July 15, 1999. The final plan approved by the Coastal Commission was for an experimental artificial reef located off San Clemente, California that tested eight different reef designs that varied in substrate composition (quarry rock or recycled concrete), substrate coverage (low, medium, and high), and presence of transplanted kelp. All eight reef designs were represented as individual 40 m x 40 m modules that were replicated in seven areas (i.e., blocks) for a total of 56 artificial reef modules totaling 22.4 acres. The Army Corps of Engineers issued its permit on August 13, 1999, and SCE completed construction of the experimental reef on September 30, 1999.

Monitoring of Experimental Reef

The Commission contract scientists produced a proposed monitoring plan for the experimental reef that was reviewed by SCE, various resource agencies and other technical specialists, and also was included in the draft PEIR for general public review. The Commission approved the proposed monitoring plan for the experimental reef on July 15, 1999.

Five years of post-construction monitoring of the experimental reef were completed in December 2004. Results from the five-year experimental phase of the artificial reef mitigation project were quite promising in that all six artificial reef designs and all seven locations (i.e., blocks) tested showed a high tendency to meet many of the performance standards established for the mitigation reef. It was concluded from these findings that a low relief concrete rubble or quarry rock reef constructed off the coast of San Clemente, California had a good chance of providing adequate in-kind compensation for the loss of kelp forest biota caused by the operation of SONGS Units 2 and 3.

A final report on all the findings and recommendations gleaned from the experimental phase of the artificial reef project was prepared by contract scientists and submitted to the Executive Director of the Commission on August 1, 2005. These findings and recommendations formed the

basis of the Executive Director's determination that: (1) the mitigation reef shall be built of quarry rock or rubble concrete having dimensions and specific gravities that are within the range of the rock and concrete boulders used to construct the SONGS experimental artificial reef, and (2) the percent of the bottom covered by quarry rock or rubble concrete on the mitigation reef should average at least 42%, but no more than 86% (the range of low to high coverage on the experimental reef modules as surveyed by the contract scientists). The Commission concurred with the Executive Director's determination for the type and percent cover of hard substrate on October 12, 2005.

Mitigation Reef Planning and Permitting

On August 8, 2006, the Commission concurred with the Executive Director's determination that SCE's preliminary Phase 2 mitigation reef plan met the requirements of the SONGS permit. The plan called for the addition of 127.6 acres of reef construction to the existing 22.4 acres built in September 1999 for the Phase 1 experimental reef. The project area is located offshore of San Clemente, California, on a parcel leased from the California State Lands Commission (SCE has modified its original 862-acre lease to 174.4 acres of mitigation reef). The preliminary design created a low-profile, single-layer reef constructed of quarried boulders and distributed in quantities similar to those of the lowest substrate coverage used for the experimental reef project. The design consisted of 11 polygons that varied in area from 2.4 to 37.5 acres. The reef design achieved the following: (1) locates the final construction site in close proximity to the San Mateo Kelp Bed, (2) avoids hard substrate areas, (3) maintains the integrity of the experimental reef modules, (4) provides for navigation channels, and (5) avoids areas of historical kelp growth as well as areas of special interest to local fisheries. On April 17, 2006 the California State Lands Commission acting on a request from SCE adopted a resolution declaring that the SONGS Mitigation Reef be named in honor of Dr. Wheeler North, a world expert on the biology and ecology of giant kelp forests.

On October 3, 2007, SCE submitted its Final Plan and a preliminary CDP application for the Phase 2 mitigation reef. The Commission approved CDP #E-07-010 on February 12, 2008. (See Exhibits 3 and 4.)

Reef Condition Compliance

Following the Commission's approval of the mitigation reef construction permit (CDP #E-07-010), SCE began preparing the final design plan in compliance with the special conditions in CDP #E-07-010. Materials submitted in compliance with the special conditions were reviewed by the Executive Director and found to fulfill the requirements of certain of those conditions. SCE had met 11 of 12 special conditions required under CDP #E-07-010 by January 2009 (See Appendix B for condition compliance dates).

SCE submitted semi-annual Kelp Wrack and Rock Hazard Monitoring reports for the four years required under Special Condition #12 for the periods October 2008-March 2012. Rock from the artificial reef was not observed on the beaches during this period. Results from SCE's monitoring also suggested that the amount of kelp wrack found on the beach was within the normal range expected for this area. A four-year report required under Special Condition #12 for the period April-September 2012 was submitted November 8, 2012. SCE continued to conduct kelp wrack and rock monitoring for an additional year as required by the State Lands Commission (SLC) permit for the Wheeler North Reef. Similar to earlier findings, the final five-

year monitoring report concluded that there was no evidence to suggest that the build-out of the Wheeler North Reef resulted in a significant increase in kelp wrack found on nearby beaches that were monitored. In light of these findings, on May 9, 2013, Commission staff issued a Notice of Acceptance to SCE, indicating that Special Condition #12 had been met.

Reef Construction and Construction Monitoring

Construction of the Phase 2 mitigation reef began on June 9, 2008 and was completed on September 11, 2008. The Phase 2 reef was designed as 18 polygons ranging in area from 1.35 to 38.88 acres for a total reef area of 153 acres. Approximately 126,000 tons of boulder-size quarry material was used to construct the reef. Quarry boulders obtained from the Pebbly Beach and Empire quarries on Catalina Island and the La Piedra quarry in Ensenada, Mexico were the exclusive construction material. Boulder dimensions averaged 2.3 ft in length, 1.8 ft in width, and 1.4 ft in height. The boulders were hauled to the construction site by barge and precisely cast upon the seafloor within the described boundaries of each polygon in roughly a single-layer. The variation of boulder deposition per polygon ranged from 743 to 987 tons per acre with an average of 829 tons per acre.

The siting of each polygon within the lease site was based on avoiding the historical distributions of giant kelp as determined from aerial surveys and the existing distribution of hard substrate (which included natural rock and the Phase 1 modules) as determined from multi-beam and sub-bottom profiling sonar surveys. The distribution of hard substrate detected by the acoustical surveys was verified by dive surveys. Additionally, the dive surveys evaluated the biological diversity of the lease area. The design also considered the historical, physical, and biological data collected during previous studies in the area and the results of experimental reef monitoring between 1999 and 2004.

The Phase 2 reef construction achieved the following desired objectives: (1) all polygons were built in close proximity to the San Mateo Kelp Bed; (2) all polygons avoided existing hard substrate areas that had historical presence of kelp; (3) the integrity of the Phase 1 Experimental Reef modules was maintained; (4) navigation channels were provided in response to concerns raised by fisherman; and (5) all constructed reef polygons avoided areas of historical kelp growth, existing areas of hard substrate, and areas of special interest to local fisheries.

Assessment of Substrate Coverage. The SONGS permit (CDP No. 6-81-330) requires that the coverage of quarry rock in the Phase 2 reef be between 42% and 86%. Commission contract scientists were charged with measuring the percentage of the seafloor covered by quarry rock in each polygon. Survey results showed that percent cover of the seafloor covered by quarry boulders ranged from 33.7% to 65.5% on the 18 polygons with an overall average of 40.8% for the entire 152 acre Phase 2 reef, which was below the required range of 42% to 86%. However, the combined area of the Phase 1 and Phase 2 reefs (which collectively is officially known as the Wheeler North Reef) totaled 176 acres, which exceeds the minimum 150-acre requirement in the SONGS CDP. Therefore, when the portions of the Phase 2 reef that did not meet the hard substrate coverage requirement (polygon 5 and the north-western section of polygon 7) were excluded from being counted toward the overall acreage requirement, the Phase 2 reef totaled 130 acres with a mean rock coverage of 42.3%. The combined total of the 130 acres of the Phase 2 reef and the 22.4 acre Phase 1 experimental reef met the minimum requirements for area (150 acres) and coverage (42%).

Monitoring Plan

The SONGS permit requires the Wheeler North Reef to be monitored, managed, and, if necessary, remediated upon the completion of its construction. The purpose of the mitigation monitoring program, conducted by independent contract scientists working for the CCC, is to: (1) determine whether the performance standards established for the mitigation reef are met, (2) determine, if necessary, the reasons why any performance standard has not been met, and (3) develop recommendations for appropriate remedial measures. The SONGS coastal development permit requires the CCC's contract scientists to develop a monitoring plan for the reef mitigation project that describes the sampling methodology, analytical techniques and methods for measuring performance of the mitigation reef relative to the performance standards identified in the SONGS coastal development permit. UCSB scientists working under contract for the CCC submitted a monitoring plan for the SONGS' reef mitigation project to the CCC on September 27, 2007. The monitoring plan contains: (1) a description of the process used to evaluate condition compliance, including a list of the performance standards by which the Wheeler North Reef will be judged and the general approach that will be used to judge the overall success of the mitigation project, (2) descriptions of the specific sampling methods and analyses used to evaluate each of the performance standards, (3) an explanation of how project data will be managed and archived for future use, and (4) a description of how the results from the monitoring program will be disseminated to the CCC, the applicant, and all other interested parties. The Monitoring Plan for the SONGS' Reef Mitigation Project is a dynamic document that is modified as needed to ensure and maintain rigorous monitoring and evaluation of Condition C in the most cost-effective manner possible. The reef monitoring plan was most recently updated in January 2015 to include general modifications to how the performance standards are evaluated

http://marinemitigation.msi.ucsb.edu/documents/artificial_reef/ucsb_%20mm_reports/mitigation_phase/monitoring_plan4reef-mitigation_project_rev_jan2015.pdf.

Reef Performance Monitoring

Concurrent monitoring of physical and biological attributes of the Wheeler North Reef and two reference reefs (San Mateo and Barn) is conducted annually to evaluate whether the Wheeler North Reef meets the performance criteria identified in Condition C. To date, Commission contract scientists have completed annual quantitative underwater surveys of all three reefs for 2009 -2015. Results from the 2014 surveys were reported at the annual public review workshops held in Dana Point, CA in April 2015.

Monitoring results obtained thus far have been mixed, with Wheeler North Reef consistently meeting many of its objectives, but failing to meet others. Notably, the absolute performance standard requiring the Wheeler North Reef to sustain 150 acres of adult giant kelp has been met continuously since 2010. Moreover, the biological community on the Wheeler North Reef has continued to develop and in 2014 the Wheeler North Reef met as many or more of the relative performance standards pertaining to the kelp forest community as the reference reefs. However, the success of the Wheeler North Reef is also assessed on its ability to meet all four absolute performance standards as well as a similar number of relative performance standards as the two reference reefs. The Wheeler North Reef has yet to meet the absolute standard that requires it to

support a fish standing stock of at least 28 tons. As of 2014 the Wheeler North Reef had not earned any mitigation credit for compensating the kelp forest resources lost due to SONGS operations. Results of analyses using longer-term data collected from the reference sites and the experimental modules during the Phase 1 and Phase 2 periods of the project indicate that the present size and configuration of the Wheeler North Reef is not sufficient to consistently support 28 tons of kelp bed fish. The CCC and SCE are discussing options for remediation, including substantially increasing the size of the mitigation reef. Section D includes additional details on remediation-related tasks that will be completed under the 2016-2017 Work Plan. More complete information on the results of monitoring the performance of the Wheeler North Reef can be found in the annual reports on kelp reef mitigation available at: http://marinemitigation.msi.ucsb.edu/documents/artificial_reef/index.html.

3. Status of Fish Behavioral Mitigation

Mitigation Requirement

Condition B of the SONGS permit requires SCE to install and maintain behavioral barrier devices at SONGS Units 2 and 3 to reduce fish impingement losses.

Fish Behavioral Mitigation Compliance

The impact studies for the operation of SONGS Units 2 and 3 conducted between 1983 and 1991 found that annual losses of juvenile and adult fish in the cooling water systems under normal operations averaged about 20 metric tons. Although the SONGS permit does not specify any criteria for evaluating the effectiveness of these devices, the Commission accepted the studies' recommendation that "the techniques" (behavioral barrier devices) "be tested on an experimental basis, and implemented if they reduce impingement by at least 2 metric tons (MT) per year", which is equivalent to at least 10% of the average loss due to impingement (Section IV–Proposed Findings and Declarations in the SONGS 1991 permit). None of the experiments showed evidence that these devices would reduce fish impingement losses as required by Condition B. At the same time, SCE continued its modified heat cleaning treatments of the cooling water intake systems of Units 2 and 3 (called the fish chase procedure), which can result in a considerable reduction in fish impingement.

In October 2000, the Commission reviewed the results of the experiments and concluded that no further testing of alternative behavioral barriers should be required at that time, provided that: (1) SCE continues to adhere to the operating, monitoring, and reporting procedures for the heat cleaning treatments, and (2) SCE makes every effort to test and install, if feasible, future technologies or techniques for fish protection if such techniques become accepted industry standards or are required by the Commission in other power plant regulatory actions. (See staff report entitled *Executive Director's Determination that Fish Behavioral Barriers Tested at SONGS are Ineffective*, dated September 22, 2000.)

The contract scientists and staff review the annual data and analyses on the fish chase procedure at SONGS against two key standards discussed in the staff report:

- (1) The **Fish Return Standard**: This standard is a measure of the effectiveness of the Fish Chase procedure used during heat treatments. This procedure can lead to a reduction in impingement by causing fish that would be impinged to be returned to the ocean by

means of the fish return system. The standard is that the return should be at least 10% of the overall impingement biomass for the year.

- (2) The **Mortality Standard**: There should not be higher than normal mortality. Higher than normal mortality is defined as: (1) a sequence of three or more heat treatments where the mortality rate exceeds 50%, (2) more than 50% of heat treatments in a given year have more than a 50% mortality rate, or (3) mortality rate for the year exceeds 50%.

Between 2000 and 2011, the fish chase Procedure effectiveness relative to impingement (Fish Return Standard) has been 10% or greater in only 7 of the last 12 years, and the Mortality Standard has been met in only 5 of those years (2000-2011). There have been only 4 years in which both standards were met.

In January 2012, SONGS Units 2 and 3 were both shut down, one unit due to routine maintenance, the other due to the discovery of a leak inside its steam generator. With the units shutdown and thus, not generating heat, SCE was unable to implement the fish chase procedure. However, shutting down SONGS Units 2 and 3 led to a significant decrease in both the intake flow rate (~96%) and velocity (~94%). In 2013, this reduction translated into reductions in the total abundance (~69%) and biomass (~94%) of fish impinged at SONGS that were significantly larger than the 10% reduction required by the Fish Return Standard in the Executive Director's 2000 determination.

With SCE's June 2013 announcement that SONGS would be permanently decommissioned, the reduction in intake volume and velocity reported in 2013 is expected to be a semi-permanent project feature, until such time as SONGS is fully decommissioned and seawater is no longer needed. Thus, as long as these intake reductions remain in place, the abundance and biomass of fish impinged by SONGS is expected to continue to be significantly lower than the long-term average measured between 1983 and 2011. Based on this information, Commission staff notified SCE in a letter dated March 27, 2015 that with the shutdown of Units 2 and 3 and the resulting decreases in intake flow and velocity and fish impingement, SCE had met the intent and requirements of Special Condition B and the Executive Director's determination regarding behavioral barriers at SONGS. As long as the reductions in intake flows are maintained, SCE is no longer required to conduct heat treatments or monitor and report on the efficacy of the Fish Chase Procedure. However, if the total intake flow increases above a monthly average of 50 MGD and/or the instantaneous flow velocity increases above 0.5 feet per second¹, SCE is required to consult with Commission staff to determine if impingement monitoring and reporting should resume.

4. Status of Hatchery Program

Permit Requirement

In two separate permit actions in 1993 and 1997, the Coastal Commission required the permittee to contribute to the California Department of Fish and Wildlife's (formerly, Dept. Fish & Game) Ocean Resources Enhancement and Hatchery Program (OREHP) for a total required mitigation

¹ These thresholds align with thresholds developed by the State Water Resources Control Board under the 2014 Once-Through Cooling Water Policy that allow an existing power plant to demonstrate compliance with the policy under Track 1, indicating that flow reductions in place are sufficient and additional monitoring is not required.

fee of \$4.8 million to be used toward the construction of an experimental white seabass fish hatchery and an evaluation program to determine if the hatchery is effective at increasing the stock of white seabass. SCE has fulfilled all of its obligations for funding the fish hatchery requirements of the SONGS permit. Permanent Commission staff provides oversight of the Department of Fish and Wildlife's continuing fish hatchery program.

California Department of Fish and Wildlife Hatchery Program

The marine fish hatchery program is operated by Hubbs Sea World Research Institute and the State of California through the Ocean Resources Enhancement and Hatchery Program (OREHP), which is administered by the California Department of Fish and Wildlife. Although the SONGS' mitigation funds were exhausted at the end of the 2004-2005 fiscal year, the OREHP program is ongoing and funded primarily through the sale of recreational fishing licenses in southern California. White seabass are spawned at a hatchery in Carlsbad operated by the Hubbs-Sea World Research Institute and then tagged and transferred to grow-out facilities operated jointly by the California Department of Fish and Wildlife and volunteer fishermen. After the fish attain a minimum length, they are released. The OREHP is currently authorized to release up to 350,000 fish annually, based on the active broodstock population at the hatchery. The OREHP operates under the terms and conditions of numerous state, local, and federal permits and authorizations. These include a Memorandum of Agreement among the California Department of Fish and Wildlife, Coastal Commission, and OREHP's Scientific Advisory Panel.

Review of the hatchery program is conducted by permanent Coastal Commission staff thus, there are no tasks funded through the SONGS work program.

D. WORK PROGRAM: 2016 AND 2017

Condition D requires the permittee to fund scientific and support staff retained by the Commission to oversee the site assessments, project design and implementation, and monitoring activities for the mitigation projects.

Implementation Structure

Scientific expertise is provided to the Commission by a small technical oversight team paid for fully by SCE through an independent accounting firm and hired under contract. The technical oversight team members include three Research Biologists from UC Santa Barbara (Principal Scientists): Stephen Schroeter, Ph.D., marine ecologist, Mark Page, Ph.D., wetlands ecologist (half time), and Daniel Reed, Ph.D., kelp forest ecologist (half-time). A part-time senior administrator (Lane Yee) completes the core contract program staff. In addition, a science advisory panel advises the Commission on the design, implementation, monitoring, and remediation of the mitigation projects. Current science advisory panel members include Richard Ambrose, Ph.D., Professor, UCLA, Peter Raimondi, Ph.D., Professor, UC Santa Cruz, and Russell Schmitt, Ph.D., Professor, UC Santa Barbara.

To meet the goals specified in the permit under Condition D and to complete the tasks identified in the 2016-2017 work program, the contract program staff is aided by contract staff biologists who are responsible for collecting and assembling the monitoring data. The contract program staff is also assisted on occasion by independent consultants and subcontractors when expertise for specific tasks is needed or when additional field assistance is needed for monitoring tasks.

The Commission's permanent staff also spends a portion of their time on this program, but except for direct travel reimbursements, their costs are paid by the Commission and are not included in the SONGS budget.

The staff implements the Commission's technical oversight and independent monitoring program through a contract with the University of California, Santa Barbara. UCSB has an international reputation for excellence in ecology and marine biology and is well equipped to support extramural contracts and grants in these areas. The UCSB contract uses the existing Principal Scientists as project managers for both the wetland restoration and reef mitigation oversight and independent monitoring, with data collection done by the university contract staff biologists under their direction. The Principal Scientists are responsible for supervising the contract staff biologists, subcontractors and consultants, authorizing purchases, and interacting with UC administrative staff on issues pertaining to personnel, budget, and UC policies (e.g., boating and diving safety regulations) relevant to the project. Monitoring of these projects is being adaptively managed in order to streamline effort and minimize costs without compromising the integrity of the data and their value in decision making with regards to the performance of the mitigation projects. Continuous interaction between the Principal Scientists and contract staff biologists is crucial to fulfilling the monitoring tasks for both the wetland restoration and mitigation reef.

Before starting the five-year experimental reef monitoring program in 1999, staff conducted a cost comparison among UCSB, other universities, and private consultants and concluded that use of a qualified university would save SCE a substantial sum over use of private consultants. Based on 1995 real cost data from private consultants for work that included the same physical and biological variables used in the SONGS reef monitoring program, costs for private consultants were nearly three times higher than the cost of implementing the monitoring program through UCSB.

The Commission concurred with staff at the start of the monitoring program and continues to find that implementing the field monitoring programs through a contract with UCSB is the most efficient, cost-effective, scientifically rigorous, and timely method of achieving the goals of the independent monitoring required by the SONGS permit.

Staffing Levels for Wetland Performance Monitoring

Staff has determined the staffing levels for the wetland monitoring tasks based on a consideration of the effort (time) involved to complete each task, location of the task (field sites, laboratory), the number of contract staff biologists required to complete each task in a timely and efficient manner, the frequency with which each task will be performed, and the expertise required to complete the task. Much of the information used to determine staffing level was developed during pre-restoration monitoring at San Dieguito Lagoon and the reference wetlands (Tijuana Estuary, Mugu Lagoon, Carpinteria Salt Marsh) and during pre-construction and construction monitoring.

The Principal Scientists will continue to be assisted in performance monitoring in 2016-2017 by three full time university contract wetland biologists and one database programmer/systems analyst working 10% time on the wetland project and based at the SONGS Mitigation Program office in Carlsbad. One full time wetland biologist based at the SONGS Mitigation Program office has primary responsibility for the continued development of the web based wetland database, which involves the preparation of data entry schemes, quality assurance and quality

control procedures, and the training of other project personnel in the use of the database. This biologist will also assist the Principal Scientists with the supervision of project staff, and with the scheduling of monitoring activities. Two other full time wetland biologists/database assistants at the SONGS Mitigation Program office have primary responsibilities to: (1) work with the wetland project database programmer/systems analyst to prepare data entry schemes, quality assurance and quality control procedures for the wetland data, (2) enter data, (3) assemble field sampling protocols, metadata, and create database user guides, and (4) conduct monitoring activities at the San Dieguito Lagoon restoration and at Tijuana Estuary, one of the reference wetlands.

The Principal Scientists will also be assisted in performance monitoring in 2016-2017 by two full time wetland biologists based at UCSB with primary responsibility for the monitoring tasks at the northernmost reference wetlands (Mugu Lagoon, Carpinteria Salt Marsh), including organizing the field sampling team and leading the field and laboratory work (assessing water quality, cover of saltmarsh vegetation and algal mats, sampling of fish and invertebrates, processing of invertebrate samples). These contract staff biologists are also responsible for organizing and entering data into the project's wetland database, quality control and quality assurance of the data, and consulting with the project's database programmer/systems analyst based in Carlsbad, as well as other tasks as needed.

Temporary employees are used to provide cost-effective assistance with the labor-intensive sampling surveys of fish and macro-invertebrates in the restored and reference wetlands. These are lower level field assistants, some may be university students, who provide logistical support with transporting gear in the wetlands, deploying and retrieving nets during sampling, collecting invertebrate samples, and recording data. Based on monitoring completed to date the Principal Scientists have determined that a total of six people are the optimal number needed to sample fish and invertebrates in each wetland. Since the San Dieguito restored wetland will be sampled concurrently during the summer with the three reference wetlands, Tijuana Estuary, Mugu Lagoon and Carpinteria Salt Marsh, the three permanent wetland contract biologists based at Carlsbad will be assisted by three temporary field assistants during the intensive summer sampling. The two permanent wetland contract biologists at UCSB will be assisted by four temporary field assistants at the two northern reference wetlands.

In addition to being skilled in invertebrate, fish and plant taxonomy, the use of environmental data loggers, global positioning systems, and data collection methods, wetland contract staff biologists have other skills, similar to those of biologists employed on the reef project, that are required to complete the monitoring requirements of the mitigation project. These skills include data entry, database development, quality control and quality assurance as well as expertise in the use of statistical software, equipment maintenance, fabrication of sampling devices, and expertise in information technology.

The Principal Scientists under contract to the Commission seek to minimize the time between sample collection, sample processing, and the analysis of collected data, so that the monitoring results can be completed and reported in a timely manner. Full time wetland contract staff are highly qualified scientists capable of performing all the technical and scientific aspects of the monitoring program.

In conclusion, the staffing levels identified in the work plan for the wetland project in 2016 and 2017 have been carefully thought out using information obtained from prior monitoring, and

vetted through the Science Advisory Panel (SAP), as the minimum level needed to meet the monitoring requirements for the wetland mitigation as specified in the SONGS permit.

Staffing Levels for Reef Performance Monitoring

A team of marine biologists employed by UCSB assists the Principal Scientists in monitoring the performance of the Wheeler North Reef. Staff has determined that the staffing levels of 8 university-certified scientific divers are required for the reef monitoring tasks. This determination is based on a number of considerations. First, university and industry accepted standards require that diving be done in pairs. Because most kelp forest organisms show substantial seasonal variation in recruitment, growth and overall abundance, data need to be collected at the mitigation reef and the two reference reefs contemporaneously during a relatively short season (June through October) each year. This, coupled with the often-marginal diving conditions typical of the project site prevents using fewer divers over a longer period of time. Second, safe diving practices limit the amount of time divers are able to spend underwater on a given day and the number of days diving in any given week. Third, full time university-trained research divers can more cost-effectively accommodate the inevitable unforeseen contingencies caused by weather or logistical constraints that arise during the course of the monitoring work than can part time employees. Fourth, completion of the field work requires a substantial level of expertise and training. UCSB's project staff biologists are trained in identifying over 200 species of benthic algae and invertebrates and some 45 species of kelp forest fishes, which is needed to properly evaluate the performance standards for the artificial reef.

Extensive use of part-time biologists would require either highly paid experts or would entail significant (and costly) training of less qualified individuals. Moreover, the logistics of deploying part-time scientific divers in an environment where field conditions for diving are often marginal and vary unpredictably is inefficient and can result in a less than satisfactory completion of assigned tasks (as was borne out during the 1999-2001 work programs in which private consultants were used for one of the tasks).

Lastly, in addition to being experts in scientific diving and data collection, UCSB's research divers are trained in a number of other tasks necessary for completing the monitoring requirements of the mitigation projects. These tasks include: data management (data entry, quality control and quality assurance) and processing using statistical and database software, equipment maintenance, fabrication of sampling devices, small marine boat operations and maintenance, and expertise in information technology. If ocean conditions are not conducive for diving, then project contract staff are assigned other project-related tasks.

The Principal Scientists employ additional temporary field assistants during the summer, the period of the most intense sampling surveys. These are lower level field biologists who are qualified to dive and drive the boats, which is especially critical during the fish surveys as the diving teams complete multiple short dives without having to anchor the boat at each location.

Based on the above considerations, the Principal Scientists have determined that eight diver biologists working full time during the six month field seasons of each year are needed to complete the reef monitoring activities. During the non-field season, five biologists working full time will be responsible for data management, analysis and reporting, network administration, equipment repair and maintenance, planning and preparation for the annual workshop required

by the SONGS permit, and other assorted tasks needed to maintain a functional working environment.

In sum, the staffing identified in the 2016-2017 work plan is predicated on meeting the monitoring requirements specified in the SONGS permit and is based on the considerable experience from the 5-year experimental reef monitoring and completion of the first seven years of performance monitoring of the mitigation reef. The currently proposed work program represents a carefully thought out minimum staffing model to accomplish the performance monitoring tasks for the next two years.

Consultation with Permittee

Pursuant to the permit conditions, the staff has consulted with SCE on the proposed work program and budget for 2016 and 2017. SCE raised concerns that the description of the wetland transitional habitat study (Task 1.1.2) was too vague and should be included as a contingency item until a more detailed understanding of how transitional habitat will be evaluated is developed. Staff explained that Task 1.1.2 describes the data collection activities necessary to assess transitional habitat. A study to develop the methodology and performance criteria for evaluation of transition habitat is currently underway by the contract scientists. Results of this study will be documented as revisions to the Wetland Monitoring Plan and will be submitted to SCE for review and discussion within the next several months. In addition, SCE commented that the wetland invertebrate study included as a contingency measure was vague and premature given the recent positive trends observed at the wetland. Staff explained that the permit requires the total densities and number of species of fish, macroinvertebrates and birds to be similar to the densities and number of species in similar habitats in the reference wetlands within four years of construction. If the wetland does not meet this requirement in 2015 (the fourth year after construction), then staff, the contract scientists and the SAP will need to determine the best course of action, which may include a study to determine why the wetland is not in compliance, and specifically why the invertebrate population at the wetland has not developed as expected (see Section F for additional details). Staff is optimistic that the wetland will be in compliance, but without this year's data, we cannot predict the outcome and thought it prudent to include the cost of this study in the contingency fund.

Following consultation on the work tasks, SCE indicated its satisfaction with the proposed Commission oversight and independent monitoring work plan and budget for the wetland, reef and fish behavioral mitigation for 2016-2017. SCE's letter of support is attached.

1. Wetlands Tasks

The SONGS permit requires independent monitoring by Commission contract scientists to determine whether the physical and biological performance standards of Condition A are met. To accomplish this task, the Principal Scientists will continue to interact closely with SCE and others involved with implementation of the Final Plan.

The following wetland tasks will be completed during the 2016-2017 work period.

1.1 Monitoring of the Restored Wetland

The SONGS permit requires the Commission's independent contract scientists to design and conduct monitoring of the restored wetland to: (1) evaluate compliance of the wetland with the

physical and biological performance standards set forth in Condition A, (2) determine, if necessary, the reasons why any performance standard has not been met, and (3) develop recommendations for appropriate remedial measures. The primary monitoring activities planned for 2016-17 entail collecting data that will be used to evaluate the performance of the restored wetland. The particular monitoring activities needed to accomplish this task are specified in the Monitoring Plan for the SONGS Wetland Mitigation Program (http://marinemitigation.msi.ucsb.edu/documents/wetland/ucsb_mm_reports/wetland_mitigation_monitoring_plan_%20updated_july2014.pdf). Wetland construction was completed upon the opening of the inlet on September 29, 2011 and performance monitoring of the wetland began in January 2012.

1.1.1 Performance Monitoring

The following tasks will be undertaken by the Principal Scientists and contract wetland biologists:

- a. *Conduct field surveys and use aerial photographs to assess the performance standards pertaining to topography and habitat areas.*

Observations by the Principal Scientists during construction monitoring indicate that noticeable sediment erosion and deposition can occur within a period of a few months. Therefore, field observational surveys will be done monthly throughout the restored San Dieguito wetland to monitor for any sign of substantial erosion or sediment deposition that could impede tidal flow within the wetland. Additional surveys will be done following extreme weather events. Annual ground surveys using RTK GPS and low level aerial photographs taken in the spring will be used to determine whether the areas of planned wetland habitats (subtidal, intertidal mudflat, vegetated marsh) have changed from areas specified in the Final Plan. Commission staff has defined 4.5' NGVD as the upper limit of tidally influenced habitat for the calculation of acreage credit for this restoration project. Because of this, the upper edge of the 4.5' contour is of special interest and will be checked annually to evaluate compliance with the acreage requirement and performance standard on habitat areas. Professional surveyors will be engaged as needed to assist in this evaluation.

- b. *Conduct field sampling and use environmental data loggers to assess the performance standards pertaining to water quality and tidal prism.*

Because of its documented importance to wetland health, the concentration of dissolved oxygen will be used to evaluate water quality within the restored wetland. Measurements of dissolved oxygen will be made using continuously recording environmental data loggers deployed in the restored and reference wetlands at sites that encompass average conditions. A reduction in the tidal prism of the restored wetland can have detrimental effects on water quality and alter the area of inundated habitat. Tidal prism will be calculated by integrating measurements of tidal flow taken near the inlet using a portable acoustic Doppler profiler/discharge measurement system over a range of predicted tides twice monthly.

- c. *Survey fish, macroinvertebrates, and birds to assess the performance standards pertaining to biological communities and food chain support.*

During pre-restoration monitoring, the Principal Scientists developed and refined methods to sample fish and macroinvertebrates. These methods were published in the scientific literature and will be used to evaluate the performance standards pertaining to biological communities. Sampling fish in the restored and reference wetlands, in particular, is a labor intensive task that requires the employment of temporary field assistants to help with enclosure trap and seine sampling during the summer. The methods developed for fish sampling employ the minimum number of personnel for completing the task and a sampling design that balances the conflicting goals of adequate spatial and temporal sample replication to evaluate wetland performance with the time, cost and impacts of sampling in the restored and reference wetlands. The performance standard pertaining to food chain support will be evaluated by measuring bird feeding activity during the same period that bird densities are measured, and using bird species that are present in both restored and reference wetlands. Bird specialists will be retained to assist the Principal Scientists to determine the abundance and number of species of birds and assess bird feeding activity.

- d. *Use aerial photographs and ground surveys to assess the performance standards pertaining to the cover of wetland vegetation and open space and the coverage of algal mats.*

The use of low-level multi-spectral aerial photography provides a means of obtaining a whole wetland estimate of the cover of vegetation, bare space and macroalgae in the restored and reference wetlands. Multi-spectral photographs also allow the identification of plant species assemblages throughout the wetlands, which is useful in locating the presence of exotic species. Aerial photographs will be taken in the restored and reference wetlands in late spring to early summer, which is the period of maximum growth of marsh plants and algae. Ground surveys for the presence of unusually thick algal mats, which typically indicates poor tidal flushing or excessive nutrient enrichment, will also be made during routine water quality monitoring.

- e. *Assess the performance standard pertaining to *Spartina* canopy architecture.*

This task will be accomplished through the measurement of the height of cordgrass (*Spartina foliosa*) stems in sampling quadrats located in stands of cordgrass. Sampling of cordgrass will be done in late spring to early summer concurrently with the monitoring of wetland vegetation.

- f. *Sample seeds of salt marsh plants to evaluate the performance standard pertaining to the reproductive success of these plants.*

The reproductive success of salt marsh plants will be evaluated by measuring the set of seed in seven plant species in the restored wetland. Sampling will be done annually in late summer-fall when seed set is expected to be greatest.

- g. *Evaluate sampling data and conduct a survey to assess the performance standard pertaining to exotic species.*

Monitoring data collected for fish, invertebrates, birds, and plants will be used to evaluate this standard. In addition, a special survey of exotic species that covers as much of the restored wetland as possible will be conducted once a year during the summer to adaptively manage for exotic species. This special survey will focus on plants and visible invertebrates and incorporate a diver survey of the subtidal portion of the main basin (W1).

1.1.2 Construction impact monitoring

- a. *Conduct surveys to determine the acreage of transition habitat that may be used to mitigate for impacts to seasonal salt marsh caused by construction*

Areas between elevations of greater than 4.5' to 5.0' NGVD are defined in the Final Restoration Plan (SCE 2005) as a transitional habitat between tidal wetlands and non-tidal or seasonal wetland habitats. In accordance with CDP 6-04-088, data on native vegetation type and cover will be collected in transitional habitat areas and compared to reference site data to determine how much of the transitional habitat acreage can be used to offset impacts to seasonal salt marsh that occurred during wetland construction.

1.2 Wetland Data Management, Analyses and Reporting

- a. *Enter, organize, and manage data collected during performance monitoring and consult with database consultants as needed.*

All monitoring data for the wetland and reef mitigation projects are entered and stored in electronic databases that use a highly redundant, multi-server system to ensure maximum data integrity, preservation, and uptime. A structure of wetland databases and web forms for data entry are being developed to facilitate data management.

- b. *Synthesize monitoring data and use them to assess whether the restored wetland is in compliance with the performance standards specified in the SONGS permit. Conduct analyses to determine reasons for any failures to meet the performance standards.*
- c. *Prepare annual reports for the Commission (with a copy to SCE) on the performance compliance of the wetland restoration project.*
- d. *Respond to requests from SCE and other parties for data and analyses.*
- e. *Maintain public website with current information on the monitoring of the wetland restoration project.*

The Principal Scientists have developed a public website that provides information on the history, current status, and other relevant information pertaining to the monitoring of the SONGS reef and wetland mitigation projects (<http://marinemitigation.msi.ucsb.edu/>). The website serves as a repository for progress reports, workshop proceedings and other project related documents and thus helps

facilitate the transfer of information between the contract scientists and the Commission, SCE, other agencies and the general public.

- f. Present monitoring results at annual public workshops and at scientific meetings deemed appropriate by the Coastal Commission and post results on the project's public website.*

1.3 Wetland Management, Oversight, and Administration

- a. Direct the monitoring studies described in the work plan. This involves planning these activities, managing personnel, and engaging consultants as needed to carry them out.*

The Principal Scientists manage a team of university contract research assistants (i.e., wetland biologists trained in data management and analyses) who are responsible for conducting the rigorous field work and extensive data management. They will also participate in field work in the restored and reference wetlands as needed to assist in data collection, resolve issues that arise in the monitoring, and conduct site visits to inspect routine and unexpected changes in the physical and biological properties of the restored and reference wetlands.

- b. Resolve any issues pertaining to logistics and data analyses that arise.*
- c. Work with University of California administrative staff on project issues pertaining to contracts, payroll, purchasing and personnel.*
- d. Maintain database software, hardware, and network services. Troubleshoot and remedy any problems that arise. Consult with computer consultants as needed to maintain reliability and security of network and desktop operations.*
- e. Attend Science Advisory Panel (SAP) meetings to discuss the status of the monitoring studies. Consult with members of other resource agencies, and the permittee and its contractors on the status of the monitoring studies.*
- f. Prepare 2018-2019 Work Plan.*

2. Reef Tasks

The permit requires the Commission's contract scientists to monitor the mitigation reef to determine whether: (1) the performance standards of Condition C are met, (2) if necessary, determine the reasons why any performance standard has not been met, and (3) develop recommendations for appropriate remedial measures. Thus the primary monitoring activities planned for 2016 and 2017 entail collecting data that will be used to evaluate the performance of the mitigation reef. The particular monitoring activities needed to accomplish this task are specified in the Monitoring Plan for the SONGS Reef Mitigation Project. Data management, analysis and reporting, network administration, equipment repair and maintenance, planning and preparation for the annual workshop required by the SONGS permit, and other assorted tasks

needed to maintain a functional working environment are the primary staff activities during the non-field season.

The following tasks pertaining to the mitigation reef will be completed during the 2016-2017 work period.

2.1 Performance Monitoring of the Wheeler North Reef

- a. *Conduct diver surveys of the Wheeler North Reef and the two reference reefs in late spring and summer of 2016 and 2017 to assess the performance standards pertaining to substrate coverage, kelp density and the benthic community of algae and invertebrates.*

Extensive analyses of data collected during the experimental phase of the reef mitigation project showed that a minimum of 82 sampling stations at the two reference reefs was needed to adequately assess whether the Wheeler North Reef was performing similarly to them with respect to the performance standards identified in Condition C. A slightly higher number of sampling stations (92) are needed to sufficiently characterize the physical and biological characteristics of the 176 acre Wheeler North Reef in order to compare it to the reference reefs. Each sampling station requires a team of 2 to 3 divers who can sample at most 2 stations per day.

- b. *Conduct diver surveys of the Wheeler North Reef and the two reference reefs in summer and autumn 2016 and 2017 to assess the performance standards pertaining to the standing stock, density, species richness, and recruitment of kelp bed fishes.*

Unlike kelp and benthic invertebrates, fish are highly mobile visual predators and their abundances as estimated by divers typically vary dramatically in space and time. Diver sampling of mobile fishes is also complicated by the fact that it requires greater underwater visibility than does the sampling of sessile bottom-dwelling algae and invertebrates. Consequently, it is not always possible to collect data on fish during the diver surveys of the kelp forest community (described in 2.1.a above). Past experience has shown that the combination of these factors requires additional fish surveys be done in summer and autumn to obtain sufficient data to properly evaluate the performance standards for fish standing stock, density, species richness, and recruitment.

- c. *Collect fish specimens during the spawning seasons (May-October) of 2016 and 2017 for use in evaluating the performance standards for fish production, fish reproductive rates, and benthic food chain support.*

Unlike the performance standards pertaining to the abundance and number of species of algae, invertebrates and fish, which can be assessed visually by divers, those pertaining to fish production, reproductive rates and food chain support require fish to be collected for processing and analyses in the laboratory. Five key indicator species were selected to evaluate these standards to minimize impacts to the fish assemblages. Data collected during previous work plans determined that 75-200 individuals of each species

collected from each reef are needed to properly evaluate these standards. These collections will have little impact on fish populations as they represent < 1% of the standing stock of these species on each of the reference reefs and ~ 0.5% of the standing stock requirement for the Wheeler North Reef. The Principal Scientists will be assisted by subcontractors from California State University, Northridge (CSUN) with expertise in fish production and reproduction.

- d. *Process samples used to evaluate the performance standards for fish production, fish reproductive rates, and benthic food chain support.*

Collected specimens must be carefully processed in the laboratory shortly after collection to obtain viable samples for evaluating the performance standards pertaining to fish production, reproductive rates and benthic food chain support. The Principal Scientists will be assisted by subcontractors from CSUN with expertise in fish production and reproduction.

- e. *Analyze prepared samples for fish growth, fecundity, and gut fullness.*

Estimates of fish growth will be used to evaluate the fish production standard. These estimates will be obtained using standard methods of analyzing annular rings in fish ear bones (otoliths). Histological analyses of female gonads will be used to evaluate the performance standard pertaining to reproductive rates, and data on gut fullness in two species that feed on the bottom will be used to assess the performance standard pertaining to benthic food chain support. The Principal Scientists will be assisted by subcontractors from CSUN with expertise in fish production and reproduction.

- f. *Monitor recruitment growth, and survivorship of *Muricea* in long-term plots on the experimental modules.*

The sea fan *Muricea* has been known to colonize artificial reefs in high densities to the exclusion of other reef biota, including giant kelp. Data collected from permanently located sampling plots on 21 rock modules of the experimental reef since summer 2000 have provided valuable information on patterns of *Muricea* colonization, growth and survivorship. Project scientists will continue to monitor these plots in 2016 and 2017 for additional colonization by *Muricea*, and to determine whether there is evidence for density dependent changes in *Muricea* growth and survivorship that might minimize (or at least stabilize) the potential adverse effects of *Muricea* on giant kelp and other components of the benthic community.

- g. *Monitor reef fish density and sizes in long-term plots on the experimental modules.*

Time series data on fish density and size in permanently located sampling plots on 21 rock modules of the experimental reef have been collected by divers since summer 2000. The longer time period of these data encompasses a much wider range of oceanic conditions than those experienced by the Phase 2 mitigation reef, and thus provide important insight into the expectations of the more recently constructed Phase 2

reef. Specifically, these data have provided valuable information on the extent to which fish biomass varies from year to year and in relation to the percent cover of rock covering the bottom. Project scientists will continue to monitor the density and sizes of fish in these plots in 2016 and 2017 for use in analyses aimed at determining the configurations (i.e. rock coverage) and footprint area needed for the Wheeler North Reef to consistently meet the performance standards.

2.2 Reef Data Management, Analyses and Reporting

a. Enter, organize, and manage data collected during the monitoring studies.

Data management and quality assurance are critically important tasks that require a substantial amount of effort by the team of contract scientists. All monitoring data for the wetland and reef mitigation projects are entered and stored in electronic databases. The SONGS reef mitigation monitoring project's data entry procedures have been designed to facilitate rapid data entry while continuing to ensure the quality and integrity of the data as they are transformed from physical to electronic form. The project employs a highly redundant, multi-server system to ensure maximum data integrity, preservation, and access. The system consists of a central data server, and multiple mirror and backup servers located at UCSB's Carlsbad office, and at the Marine Science Institute on UCSB's main campus in Santa Barbara, CA. The operation, maintenance, and security of this system require a dedicated system administrator in Carlsbad who works closely with the scientific staff on the project and with system administrators on UCSB's main campus.

b. Respond to requests from SCE and other parties for data and analyses.

c. Maintain public website with current information on the monitoring of the reef mitigation project.

The Principal Scientists have developed a public website that provides information on the history, current status, and other relevant information pertaining to the monitoring of the SONGS reef and wetland mitigation projects (<http://marinemitigation.msi.ucsb.edu/>). The website serves as a repository for annual reports, workshop proceedings and other project related documents, and thus helps facilitate the transfer of information between the contract scientists and the Commission, SCE, other agencies and the general public.

d. Synthesize monitoring data and use them to assess whether the mitigation reef is in compliance with the biological and physical performance standards specified in the SONGS permit. Conduct analyses to determine reasons for any failures to meet the performance standards.

e. Present monitoring results at annual public workshops and at scientific meetings deemed appropriate by the Coastal Commission and post results on the project's public website.

- f. *Prepare annual reports for the Commission (with a copy to SCE) on the performance of the mitigation reef project and post annual reports on the project's public website.*

2.3 Analyses and Planning for Reef Remediation

- a. *Conduct and refine analyses using existing time series data to determine the area of additional reef that is needed for the Wheeler North Reef to consistently meet the performance standards. Develop estimates for varying combinations of reef bottom coverage and vertical relief*
- b. *Meet with members of the Science Advisory Panel, Coastal Commission staff, SCE and other appropriate agencies (if needed) to discuss the merits and disadvantages of implementing different reef designs for remediation, including those associated with obtaining permits required for construction.*
- c. *Review SCE proposed designs for reef remediation to ensure compliance with SONGS permit.*

2.4 Reef Project Management, Oversight, Administration, and Daily Operation

- a. *Consult with members of the Science Advisory Panel, Coastal Commission staff, other resource agencies, and the permittee and its contractors on the status of the reef mitigation project and inform them of any unexpected changes or concerns that might arise.*
- b. *Direct the field and analytical studies described in the 2016-2017 Work Plan.*

The Principal Scientists manage a team of university research assistants (i.e., marine biologists trained in scientific diving and data management and analyses) who are responsible for conducting the rigorous field work and extensive data management. They also dive periodically at the artificial reef and nearby reference reefs as needed to resolve issues that arise in the monitoring, and conduct site visits to inspect routine and unexpected changes in the physical and biological properties of the artificial reef and natural reference reefs.

- c. *Perform assorted tasks to maintain University of California research diver certification (e.g. pass physical exams, attend classes in CPR, First-Aid, Nitrox, O₂ administration, complete dive logs, service scuba equipment, etc.).*
- d. *Maintain boats, vehicles and other equipment in proper working condition.*
- e. *Perform assorted tasks to maintain a functional working environment.*
- f. *Work with University of California administrative staff on project issues pertaining to contracts, payroll, purchasing and personnel.*
- g. *Maintain database software, hardware, and network services.*

Troubleshoot and remedy any problems that arise. Work with UC computer consultants as needed to maintain reliability and security of network and desktop operations.

h. Prepare 2018-2019 Work Plan.

E. BUDGET: 2016 AND 2017

Condition D of the permit requires SCE to fund the Commission's oversight of the mitigation and independent monitoring functions identified in and required by Conditions A through C. The permittee is required to provide "reasonable and necessary costs" for the Commission to retain personnel with appropriate scientific or technical training and skills, as well as reasonable funding for necessary support personnel, equipment, overhead, consultants, the retention of contractors needed to conduct identified studies, and to defray the costs of members of any scientific advisory panel convened by the Executive Director to provide advice on the design, implementation, monitoring and remediation of the mitigation projects. The Commission has operated under approved work programs and budgets since 1993. The funds for the oversight and monitoring program are managed by an independent accounting firm.

The budgets for the Commission's monitoring and oversight program are "zero-based budgets," that is, each budget period begins anew, based on the proposed activities, with no funds from the previous budget carried forward to the new budget period. The total budget to implement the work program is intended as a "not-to-exceed" amount. The permittee provides funds periodically throughout the budget period rather than as a lump sum to minimize the advance outlay of cash. Any funds not expended at the end of the budget period are returned to the permittee.

History of Expenditures for Independent Monitoring

The Commission began its oversight and independent monitoring program in November 1991 following adoption in July 1991 of the SONGS mitigation requirements. This start-up period was funded directly by SCE and covered the work necessary to establish the implementing structure and the initial administration of the program. The next year the Commission operated under an interim work program and budget, during which time the first contract scientists were hired and the Scientific Advisory Panel convened to begin working with SCE on project planning. The Commission approved annual work programs and budgets for calendar years 1994 through 1997, and then, in accordance with the provisions of the permit, adopted two-year work programs and budgets beginning with the 1998-1999 period. These work programs have included planning, environmental analyses, permit compliance issues, five years of experimental reef monitoring, construction monitoring and the first seven years of performance monitoring of the Phase 2 mitigation reef, pre-restoration and construction monitoring for the wetland project, development of performance monitoring plans, and four years of performance monitoring at the wetland. The status section of this report (see Section C) summarizes the accomplishments of the Commission's program.

The budgets and expenditures for the SONGS oversight and monitoring program since its inception are summarized below. As a normal practice, the Commission requires an independent financial audit of its expenditures for each budget period. To date, those audits have disclosed no discrepancies or deficiencies in the financial systems.

SONGS 2016-2017 Work Program and Budget

Period	Total Budget	Actual Expenditures
Nov 1991-Dec 1992	\$ 57,654	\$ 57,654
Oct 1992-Dec 1993	610,646	334,632
1994	1,173,105	387,096
1995	849,084	467,888
1996	440,139	397,631
1997	423,035	379,571
1998-1999	1,039,072	970,118
2000-2001	2,293,162	2,151,820
2002-2003	2,423,045	2,174,706
2004-2005	2,338,957	2,256,543
2006-2007	2,266,141	2,162,750
2008-2009	3,055,170	2,776,632
2010-2011	3,953,014	3,559,266
2012-2013	4,738,886	4,634,500
2014-2015	5,214,283	4,969,896 (projected)
24-YEAR TOTAL	\$30,875,393	\$27,680,703

The oversight and independent monitoring program has consistently come in under budget, and in some years substantially so. The early work programs and budgets were marked by considerable uncertainty in the timing of the planning process for the two major projects (wetland restoration and experimental kelp reef) as well as significant discussions with SCE regarding the Commission staff’s interpretation of the permit conditions. In more recent years, the staff has been able to better predict the funding necessary to carry out the program. As performance monitoring for the mitigation projects is implemented, the staff, in consultation with SCE, has made its best predictions for the required tasks, timing, and funding necessary to support those tasks in the 2016 and 2017 work program and budget.

Proposed Budget for 2016 and 2017

The proposed budget for calendar years 2016 and 2017 covers the monitoring and oversight program costs for the Commission’s contract scientists, contract field biologists and subcontractors to monitor the wetlands and mitigation reef, science advisory panel, consultants, contract administrative support, and operating expense during the two-year budget period. All of the current and proposed contract program staff, except for the part-time administrator, are hired under contract with the University of California, Santa Barbara, while subcontractors are retained through separate contracts. Costs associated with the implementation of the SONGS permit and attributable to permanent Coastal Commission staff work are not paid by the permittee and thus are not included in this budget.

The funding proposed to cover the monitoring and oversight program costs during the two-year budget period (calendar years 2016 and 2017) is \$5,844,930 as shown below. This budget is based on the minimum scientific staff required to accomplish the goals of the SONGS permit and carry out the proposed tasks (see discussion above). The wetland project will continue with its fourth and fifth year of performance monitoring in 2016-2017. The eighth and ninth years of performance monitoring will be the primary work for the reef. Personnel rates are set by U.C.

Systemwide Administration. Narrative budget notes explaining each budget category are contained in Appendix A.

SONGS PROGRAM BUDGET 2016

	2016 Wetland	2016 Reef	2016 Admin/Mgt	2016 Total
SALARIES				
Core Program Staff				
Principal Scientist (0.5 PY)	9,831	88,478		98,308
Principal Scientist (1.0 PY)	67,468	67,468		134,935
Principal Scientist (0.5 PY)	52,806	5,867		58,673
Senior Administrator (0.15 PY)			17,893	17,893
Field Biologists				
Computer & Network Technologist IV (1.0 PY)	11,675	105,071		116,746
Staff Research Associate IV (1.0 PY)		73,901		73,901
Staff Research Associate IV (1.0 PY)	67,095			67,095
Staff Research Associate II (1.0 PY)		49,908		49,908
Staff Research Associate II (1.0 PY)	53,889			53,889
Staff Research Associate II (1.0 PY)	49,908			49,908
Staff Research Associate II (1.0 PY)	49,908			49,908
Staff Research Associate I (1.0 PY)		49,908		49,908
Staff Research Associate I (1.0 PY)		49,908		49,908
Staff Research Associate I (1.0 PY)	42,360			42,360
Lab Assistant III (3 @ 6 mos, 1.5 PY)		61,552		61,552
Lab Assistant I (4 @ 4 mos; 1.33 PY)	55,117			55,117
Lab Assistant I (3 @ 6 mos; 1.5 PY)	61,552			61,552
SUBTOTAL SALARIES	521,607	552,059	17,893	1,091,558
UCSB Indirect Cost @ 26% (excluding SrAdmin)	135,618	143,535		279,153
TOTAL SALARIES	657,224	695,594	17,893	1,370,711
BENEFITS				
Core Program Staff				
Principal Scientist	3,827	34,441		38,268
Principal Scientist	26,182	26,182		52,363
Principal Scientist	19,900	2,211		22,111
Field Biologists				
Computer & Network Technologist IV	5,364	48,277		53,641
Staff Research Associate IV		29,676		29,676
Staff Research Associate IV	27,373			27,373
Staff Research Associate II		29,553		29,553
Staff Research Associate II	23,106			23,106
Staff Research Associate II	21,199			21,199
Staff Research Associate II	34,759			34,759
Staff Research Associate I		29,006		29,006
Staff Research Associate I		21,478		21,478
Staff Research Associate I	25,808			25,808
Lab Assistant III (3)		5,170		5,170
Lab Assistant I (4)	4,630			4,630
Lab Assistant I (3)	5170			5,170
SUBTOTAL BENEFITS	197,318	225,978		423,296
UCSB Indirect Cost @ 26%	51,303	58,754		110,057
TOTAL BENEFITS	248,620	284,733		533,353

2016 Budget continued.

	2016 Wetland	2016 Reef	2016 Admin/Mgt	2016 Total
SCIENTIFIC ADVISORY PANEL	52,875	52,875		105,749
CONSULTANTS AND CONTRACTORS				
Wetlands				
Task 1.1a&d – Aerial photo surveys	55,000			55,000
Task 1.1a&d - Wetland Engineering Habitat Delineation	21,572			21,572
Task 1.1c - Bird sampling	59,328			59,328
Reef				
Task 2.1c-d-e - Fish reproductive rates, food chain support, and fish reproduction		260,708		260,708
Task 2.3 - Engineering review of reef remediation		20,000		20,000
UCSB Indirect Cost @ 26% ²	19,909	11,700		31,609
TOTAL CONSULTANTS & CONTRACTORS	155,809	292,408		448,217
TRAVEL				
Reimbursement for permanent CCC staff	8,800	8,800		17,600
UCSB Principal Scientists, Field Biologists	21,121	25,000		46,121
UCSB indirect cost (excl. CCC staff)	5,491	6,500		11,991
TOTAL TRAVEL	35,412	40,300		75,712
OPERATING EXPENSE				
General expense (SF office)			32,000	32,000
General expense (UCSB contract, incl. indirect cost)	55,836	101,324		157,160
Facilities operations (Carlsbad office) & Marina storage/offsite facilities (UCSB contract)	53,521	58,801		112,322
Computer technical support, repair & maintenance			1,500	1,500
Review workshop			1,700	1,700
Administrative/financial processing services			12,000	12,000
TOTAL OPERATING EXPENSE	109,357	160,125	47,200	316,682
EQUIPMENT				
Two boat trailers (UCSB)		20,684		20,684
Miscellaneous equipment, as needed (UCSB)	15,000			15,000
Water quality environmental data loggers (UCSB)	7,200			7,200
TOTAL EQUIPMENT	22,200	20,684		42,884
TOTAL EXPENSE 2016	1,281,497	1,546,719	65,093	2,893,309

² Indirect costs are applied to all contracts held by UCSB. The contract for Task 2.1 c-d-e is charged 26% only on the first \$25,000 of the 2-yr contract. The contract under Task 1.1c for \$59,328 is not held by UCSB and does not include this overhead charge.

SONGS PROGRAM BUDGET 2017

	2017 Wetland	2017 Reef	2017 Admin/Mgt	2017 Total
SALARIES				
Core Program Staff				
Principal Scientist (0.5 PY)	10,027	90,247		100,275
Principal Scientist (1.0 PY)	68,817	68,817		137,634
Principal Scientist (0.5 PY)	58,947	6,550		65,496
Senior Administrator (0.15 PY)			18,556	18,556
Field Biologists				
Computer & Network Technologist IV (1.0 PY)	12,083	108,749		120,832
Staff Research Associate IV (1.0 PY)		76,487		76,487
Staff Research Associate IV (1.0 PY)	69,443			69,443
Staff Research Associate II (1.0 PY)		48,965		48,965
Staff Research Associate II (1.0 PY)	55,776			55,776
Staff Research Associate II (1.0 PY)	53,994			53,994
Staff Research Associate II (1.0 PY)	53,994			53,994
Staff Research Associate I (1.0 PY)		50,077		50,077
Staff Research Associate I (1.0 PY)		48,965		48,965
Staff Research Associate I (1.0 PY)	44,600			44,600
Lab Assistant III (3 @ 6 mos, 1.5 PY)		63,398		63,398
Lab Assistant I (4 @ 4 mos; 1.33 PY)	55,117			55,117
Lab Assistant I (3 @ 6 mos; 1.5 PY)	62,460			62,460
SUBTOTAL SALARIES	546,910	562,254	18,556	1,127,720
UCSB Indirect Cost @ 26% (excluding SrAdmin)	142,197	146,186		288,383
TOTAL SALARIES	689,107	708,440	18,556	1,416,103
BENEFITS				
Core Program Staff				
Principal Scientist	3,926	35,333		39,258
Principal Scientist	26,860	26,860		53,720
Principal Scientist	22,347	2,483		24,830
Field Biologists				
Computer & Network Technologist IV	5,579	50,211		55,790
Staff Research Associate IV		30,887		30,887
Staff Research Associate IV	28,487			28,487
Staff Research Associate II		29,085		29,085
Staff Research Associate II	24,040			24,040
Staff Research Associate II	23,056			23,056
Staff Research Associate II	37,726			37,726
Staff Research Associate I		29,220		29,220
Staff Research Associate I		21,182		21,182
Staff Research Associate I	27,273			27,273
Lab Assistant III (3)		5,325		5,325
Lab Assistant I (4)	4,769			4,769
Lab Assistant I (3)	5,247			5,247
SUBTOTAL BENEFITS	209,309	230,587		439,896
UCSB Indirect Cost @ 26%	54,420	59,953		114,373
TOTAL BENEFITS	263,730	290,540		554,270

2017 Budget continued.

	2017 Wetland	2017 Reef	2017 Admin/Mgt	2017 Total
SCIENTIFIC ADVISORY PANEL	54,657	54,657		109,314
CONSULTANTS AND CONTRACTORS				
Wetlands				
Task 1.1a&d-aerial photo surveys	55,000			55,000
Task 1.1a&d-Wetland Engineering Habitat Delineation	21,572			21,572
Task 1.1c-bird sampling	59,328			59,328
Reef				
Task 2.1c-d-e-fish reproductive rates, food chain support, and fish reproduction		260,708		260,708
UCSB Indirect Cost @ 26% ³	19,909	0		19,909
TOTAL CONSULTANTS & CONTRACTORS	155,809	260,708		416,517
TRAVEL				
Reimbursement for permanent CCC staff	5,185	5,185		10,370
UCSB Principal Scientists & Field Biologists	21,902	25,925		47,827
UCSB indirect cost (excl. CCC staff)	5,695	6,741		12,436
TOTAL TRAVEL	32,782	37,851		70,633
OPERATING EXPENSE				
General expense (SF office)			33,184	33,184
General expense (UCSB contract, incl. indirect cost)	57,877	105,099		162,976
Facilities operations (Carlsbad office) & Marina storage/offsite facilities (UCSB contract)	54,632	60,108		114,740
Computer technical support, repair & maintenance			1,500	1,500
Review workshop			1,763	1,763
Audit			4,000	4,000
Administrative/financial processing services			12,000	12,000
TOTAL OPERATING EXPENSE	112,509	165,207	52,447	330,163
EQUIPMENT				
Two 250 hp outboard engines (UCSB)		31,600		31,600
Miscellaneous equipment, as needed (UCSB)	15,555			15,555
Water quality environmental data loggers (UCSB)	7,466			7,466
TOTAL EQUIPMENT	23,021	31,600		54,621
TOTAL EXPENSE 2017	1,331,615	1,549,003	71,003	2,951,621

TWO-YEAR TOTAL EXPENSE FOR 2016 and 2017**\$5,844,930**

³ Indirect costs are applied to all contracts held by UCSB. The contract for Task 2.1 c-d-e is charged 26% only on the first \$25,000 of the 2-yr contract. The contract under Task 1.1c for \$59,328 is not held by UCSB and does not include this overhead charge.

F. PRE-APPROVED CONTINGENCY FUND FOR 2016 AND 2017

Staff is proposing pre-approved contingency funds in the amount of \$237,904, specifically for potential additional costs for: (1) the Scientific Advisory Panel, (2) early office lease termination, and (3) unexpected repair and/or replacement of field vehicles and (4) in –depth analysis of invertebrates at the wetland. Staff proposes these pre-approved contingency funds as a way of reducing the overall budget, but still providing the necessary Commission authorization for certain specified activities that may become necessary during the two-year work period. Staff has used this approach since the 2002-2003 work program. To date, staff has not had to use the contingency funds.

A contingency amount is proposed for the Scientific Advisory Panel as that effort may increase over past years' expenditures for advice to the Commission on the performance monitoring for the wetland restoration and mitigation reef projects, as well as potential compliance issues with the performance standards contained in the SONGS permit. Although the permit authorizes the Scientific Advisory Panel to be funded up to \$100,000 *per year*, plus annual adjustments due to increases in the consumer price index applicable to California⁴, staff proposes less total funding for the Scientific Advisory Panel for the two budget years (\$105,749 for 2016 plus \$109,313 for 2017, for a two-year total of \$215,063) based on current rates of expenditure. However, the overall budget does not provide any cushion for any increased effort that may be required; thus, the staff proposes a two-year pre-approved contingency fund amount of \$164,430 to be earmarked for the Scientific Advisory Panel to allow the timely response to changing circumstances. This amount is derived from the total authorized amount for the two years as adjusted (\$379,493, see footnote) less the budgeted amount (\$215,063).

In addition, staff proposes funds for early lease termination for the Carlsbad office. The need for early lease termination is unlikely; however, should circumstances arise that necessitate canceling the lease, the contingency fund amount of \$34,473 would be available to satisfy the lease obligations. Similarly, the contingency fund includes \$15,000 for unexpected repairs or replacement of the 15+ year old, high mileage field vehicles.

Finally, staff proposes to include \$24,000 in the contingency fund to evaluate, if necessary, the failure of the wetland mitigation project to meet the performance standards for the total density and number of species of macro-invertebrates. The SONGS permit provides performance standards that are required to be met by the wetland mitigation project to ensure that the project is successful. The standard for Biological Communities requires that within 4 years of construction, the total densities and number of species of fish, macro-invertebrates and birds shall be similar to the densities and number of species in similar habitats in the reference wetlands that are used as the standard of comparison. While the species richness and densities of birds and fish have successfully met the performance standards the past 3 years, the species richness and total density of macro-invertebrates in the restored wetland have underperformed relative to the reference wetlands.

⁴ Based on the average percent change in the Consumer Price Index-All Urban Consumers for the San Francisco and San Diego areas from the original 1991 permit to mid-year 2013, the adjusted amount for 2016 is \$186,300. A 3.7% escalator is used for estimating adjustments for 2017, resulting in an adjusted amount for 2017 of \$193,193. Thus, the total adjusted amount authorized for the two budget years 2016 and 2017 is \$379,493.

Monitoring results to date for macro-invertebrate species richness and density are summarized in the table below. These standards are evaluated in both main channel and tidal creek habitats. A “YES” indicates that the performance standard was met for that year. A “NO” indicates that the performance standard was not met for that year.

Performance standard	Habitat	2012	2013	2014	2015*
Species richness	Main channel	YES	YES	NO	?
	Tidal creek	NO	NO	YES	?
Density	Main channel	NO	NO	NO	?
	Tidal creek	NO	NO	NO	?

*in progress

In 2014, only species richness of macro-invertebrates in tidal creek habitat met the performance standard. Species richness in main channel habitat did not meet the standard despite meeting it the previous two years. The performance standard for density has yet to be met in main channel or tidal creek habitat. As a result, CCC staff are concerned that macro-invertebrate species richness and density will underperform in 2015, affecting the ability of the restoration project to meet the performance standards for Biological Communities in Year 4 (2015) as required by the SONGS permit. Therefore, staff proposes to allocate contingency funds for studies deemed necessary by the Executive Director on advice of the independent contract scientists to determine the reasons for any failure to meet the performance standards for macro-invertebrates and recommend remediation if necessary.

Any expenditure from the pre-approved contingency fund would be made in consultation with SCE. If a dispute arises, the staff would bring the issue to the Commission for resolution.

Appendix A: Detailed list of condition compliance dates for the wetland

- On August 22, 2006, Commission staff issued the Notice of Acceptance for condition compliance required prior to issuance of the permit and issued CDP #6-04-88.
- On September 13, 2006, Commission staff issued the Notice of Acceptance for condition compliance required prior to commencement of construction; however, the Notice of Acceptance excluded authority to construct certain plan elements that require compliance with additional site-specific conditions (i.e., least tern nesting habitat, public trails, freshwater runoff treatment ponds, inlet dredging, use of North Beach staging area and beach restoration activities, river bend revetment, a disposal site, and a mitigation site).
- On October 2, 2006, Commission staff issued the Notice of Acceptance for condition compliance required prior to commencement of construction of segments 1 through 3 of the Coast-to-Crest public trail (from Jimmy Durante Boulevard along the northern edge of the river to I-5).
- On November 20, 2006, Commission staff issued the Notice of Acceptance for condition compliance required prior to commencement of construction on disposal site DS32.
- On November 29, 2006, Commission staff issued the Notice of Acceptance for condition compliance on a revised design and alignment for the temporary construction haul road under Interstate Highway 5.
- On January 29, 2007, Commission staff issued the Notice of Acceptance for condition compliance required prior to commencement of construction of the Least Tern nesting sites.
- On February 20, 2007, Commission staff issued the Notice of Acceptance for condition compliance on a revised construction haul road route to Disposal Site 36.
- On November 21, 2007, Commission staff issued the Notice of Acceptance for condition compliance required prior to commencement of construction of the Freshwater Runoff Treatment Ponds and Segments 4 through 8 of the Coast to Crest Trail.
- On June 3, 2010, Commission staff issued the Notice of Acceptance for condition compliance required prior to commencement of construction of the North Beach access improvements.
- On September 15, 2010, Commission staff issued the Notice of Acceptance for condition compliance required prior to commencement of construction of the riverbank revetment.
- On November 30, 2010, Commission staff issued the Notice of Acceptance for condition compliance required for the 29th Street South Beach access improvements.
- On January 27, 2011, Commission staff issued the Notice of Acceptance for condition compliance required for the inlet channel excavation and dredging.
- On April 6, 2011, Commission staff issued the Notice of Acceptance for condition compliance required for dredge disposal.
- On August 10, 2011, Commission staff issued the Notice of Acceptance for condition compliance required for Least Tern nesting sites and beach nourishment/dredge disposal.

- On August 29, 2011, Commission staff issued the Notice of Acceptance for condition compliance required for the North Beach Staging Area plan.
- On December 20, 2011, Commission staff issued the Notice of Acceptance for condition compliance required for the JPA Mitigation Program for Trail and Treatment Pond Impacts. The potential to restore additional acreage within the San Dieguito restoration site as proposed by other parties had delayed a portion of the JPA's mitigation program and required consideration of alternative mitigation sites. A material amendment was approved in September 2011 to address these changes (see Amendment 10).
- On January 26, 2012, Commission staff issued the Notice of Acceptance for condition compliance required for final construction information for Least Tern Nesting Sites.
- On September 26, 2014, Commission staff issued a Notice of Acceptance for the San Dieguito Lagoon October 2014 maintenance dredging plans. Dredging of the inlet has been delayed until winter 2015.

Appendix B: Detailed list of condition compliance dates for the reef

- On March 25, 2008, Commission staff accepted the additional GIS data and files requested for the experimental reef modules and the phase 2 mitigation reef polygons.
- On April 14, 2008, Commission staff issued the Notice of Acceptance for condition compliance required prior to issuance of the permit and issued CDP #E-07-010.
- On May 16, 2008, Commission staff issued the Notice of Acceptance for condition compliance required prior to commencement of construction.
- On August 22, 2008, Commission staff issued the Notice of Acceptance for condition compliance requiring an initial construction audit.
- On January 27, 2009, Commission staff issued the Notice of Acceptance for condition compliance requiring a final construction report. Acreage from the experimental reef modules (22.4 acres) and “as-built” primary reef polygons (130.3 acres) shown on Exhibit 4 meet the SONGS permit and SCE *Final Design Plan* specifications required by CDP #E-07-010.

Appendix C: Budget Notes

SALARIES. Includes salaries and wages for the contract program staff, which includes two scientist positions, administrative support, and field biologists. All of the current and proposed contract program staff except a part-time administrator are hired under contract with the University of California, Santa Barbara; costs include the University's indirect costs.⁵ The part-time administrator is hired under contract with Simpson & Simpson CPAs, the firm that provides financial services for the program. The costs for the Commission's permanent staff that spend a portion of their time on this program are not included here; they are paid by the Commission.

BENEFITS. Includes benefits and employer-paid payroll taxes for contract program staff. Includes the indirect costs for personnel hired under contract to UCSB.

SCIENTIFIC ADVISORY PANEL. The Scientific Advisory Panel is a panel of experts established by the Commission pursuant to the permit conditions to provide scientific and technical advice. Expenses cover members' time and travel and are authorized in the permit at \$100,000 per year adjusted annually in accordance with the consumer price index (CPI) applicable to California. CPI adjustments have been made in previous budgets. Based on previous years' expenditures, staff budgeted less than the authorized amount. However, staff proposes additional funds in a pre-approved contingency fund up to the adjusted yearly authorized amount to be expended as needed, in consultation with SCE.

CONSULTANTS AND CONTRACTORS. Includes estimated costs for consultants and contractors to provide the technical and expert advice identified in individual tasks of the work program to assist the contract scientists in completing the tasks. Estimated costs are based on previous experience with similar consultants, at rates ranging from \$50 to \$210 per hour.

TRAVEL. Covers travel for meetings with SCE, Commission staff, consultants and contractors, field monitoring work, attendance at agency and public workshops and meetings, site visits, and attendance at conferences related to wetland and kelp forest community restoration issues. Total travel costs are based on previous years' expenditures plus anticipated increases in airline fares. A 3.7% escalator is applied for 2017.

GENERAL EXPENSE (SF). Covers operating expense for contract program staff working out of the Commission's San Francisco office (part-time administrator). Annual costs are based on the Commission's operating expense per PY for general expense, printing, communications, postage, training and facilities operations.

GENERAL EXPENSE (UCSB CONTRACT). Covers annual costs for reef surveys (NITROX for SCUBA), miscellaneous office, laboratory and field supplies, annual boat operating expense, annual insurance, registration and license fees for boats and vehicles, annual dive physicals required of each diver, and on-campus communications services for contract staff located at UCSB. A 3.7% escalator is applied for 2017.

FACILITIES OPERATIONS (UCSB CONTRACT). Rented office space in Carlsbad houses one full time contract scientific staff and contract field biologists for the reef and wetland monitoring programs. Annual costs cover space rental, utilities, security, office services and supplies, and communications (including telephone, cell phone service, and DSL service). A 3.7% escalator is used for 2017 where anticipated increases are not yet known.

OFFSITE STORAGE/FACILITIES (UCSB CONTRACT). Covers costs for storage and launch fees for the reef dive boats. A 3.7% escalator is applied for 2017.

COMPUTER TECHNICAL SUPPORT. Covers costs for maintaining the computers used by contract program staff and field biologists, including regular maintenance, repairs, and technical support needed for troubleshooting problems.

REVIEW WORKSHOP. Covers costs for conducting an annual review workshop, excluding costs for consultants who may be requested to attend the workshop. The intent of the workshop is to review whether performance

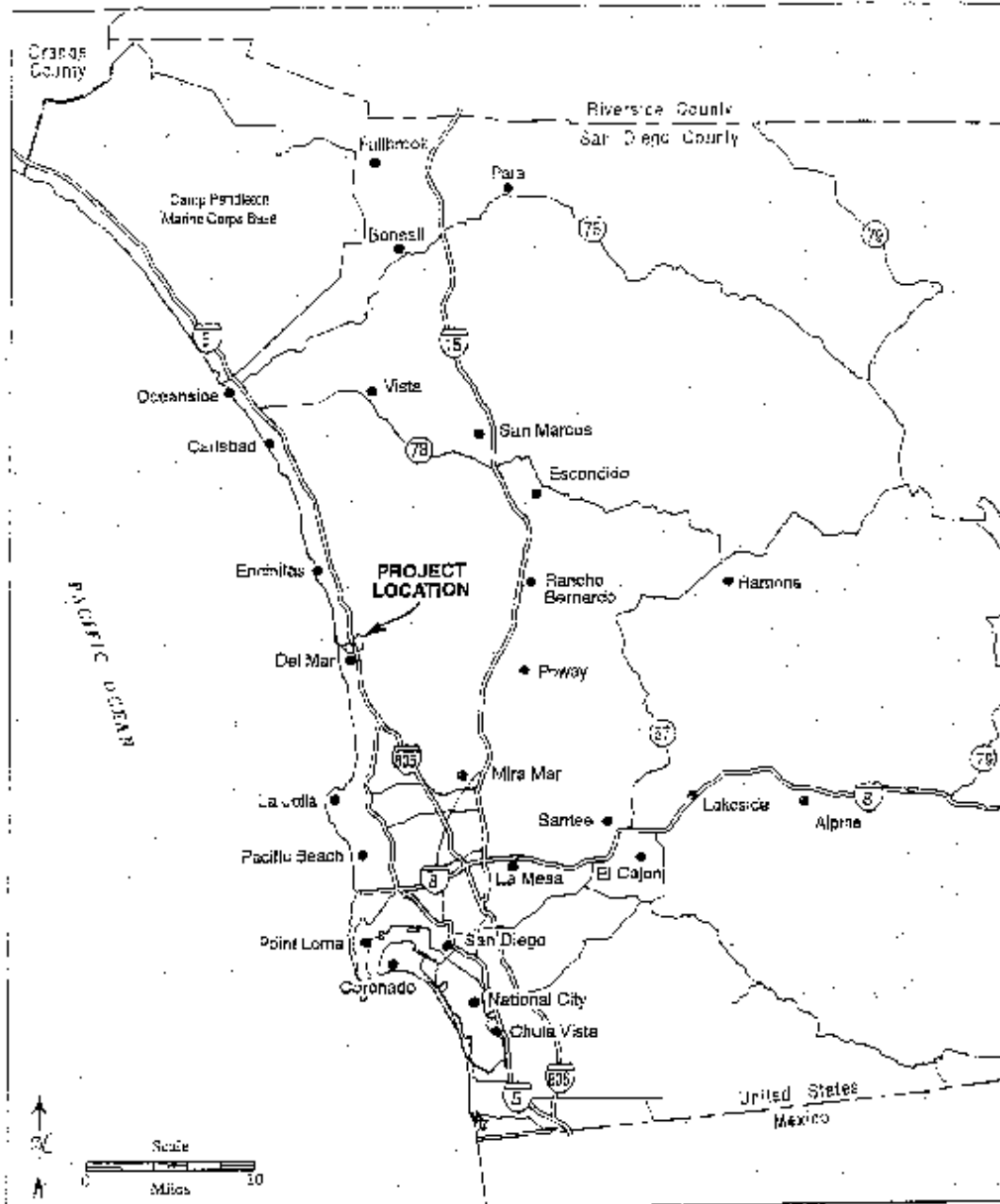
⁵ The indirect cost rate of 26% of direct costs is the U.S. Department of Health and Human Services negotiated, pre-determined off-campus rate for research projects. For these costs, the project receives: office space at UCSB for two 0.5 PY contract scientists (even though the on-campus overhead rate is normally 46%), utilities, internet services, laboratory facilities and equipment, administrative services associated with payroll, employee benefits, liability insurance, dive and boat safety programs, and purchasing for both on-campus staff and staff located in the Carlsbad office, library services, UC subsidized pricing on goods and services, site licenses for software, and access to faculty and staff expertise on a wide variety of issues.

standards have been met, whether revisions to the standards are necessary, and whether remedial measures are required. A 3.7% escalator is applied for 2017.

AUDIT. Covers costs for an independent audit of the contract reimbursements and service fees for the Commission's oversight and monitoring program. Independent audits have been conducted since 1994; no deficiencies in the financial systems have been discovered. Costs are estimated for a 2-year audit.

ADMINISTRATIVE/FINANCIAL PROCESSING SERVICES. Covers the annual cost of administrative and financial processing services provided by Simpson & Simpson CPAs.

EQUIPMENT. Covers durable equipment for the reef and wetland monitoring programs, including computers and networking equipment, office equipment (such as scanner or copier), and miscellaneous equipment. A 3.7% escalator is applied where applicable for 2017. Also included are funds for water quality data loggers for the wetland monitoring program and replacement of outboard engines for two dive boats used for the reef monitoring program.



San Dieguito Wetland Restoration Project Regional Location Map

EXHIBIT 1: Wetland Restoration Project Location



San Dieguito Wetland Restoration Project

San Diego State University
 2011-2012
 10/13/2011

GIS exhibits may be composed from various sources with different levels of accuracy.
 For details on accuracy of this exhibit please refer to data that provided.

EXHIBIT 2: San Dieguito Wetland Restoration Plan

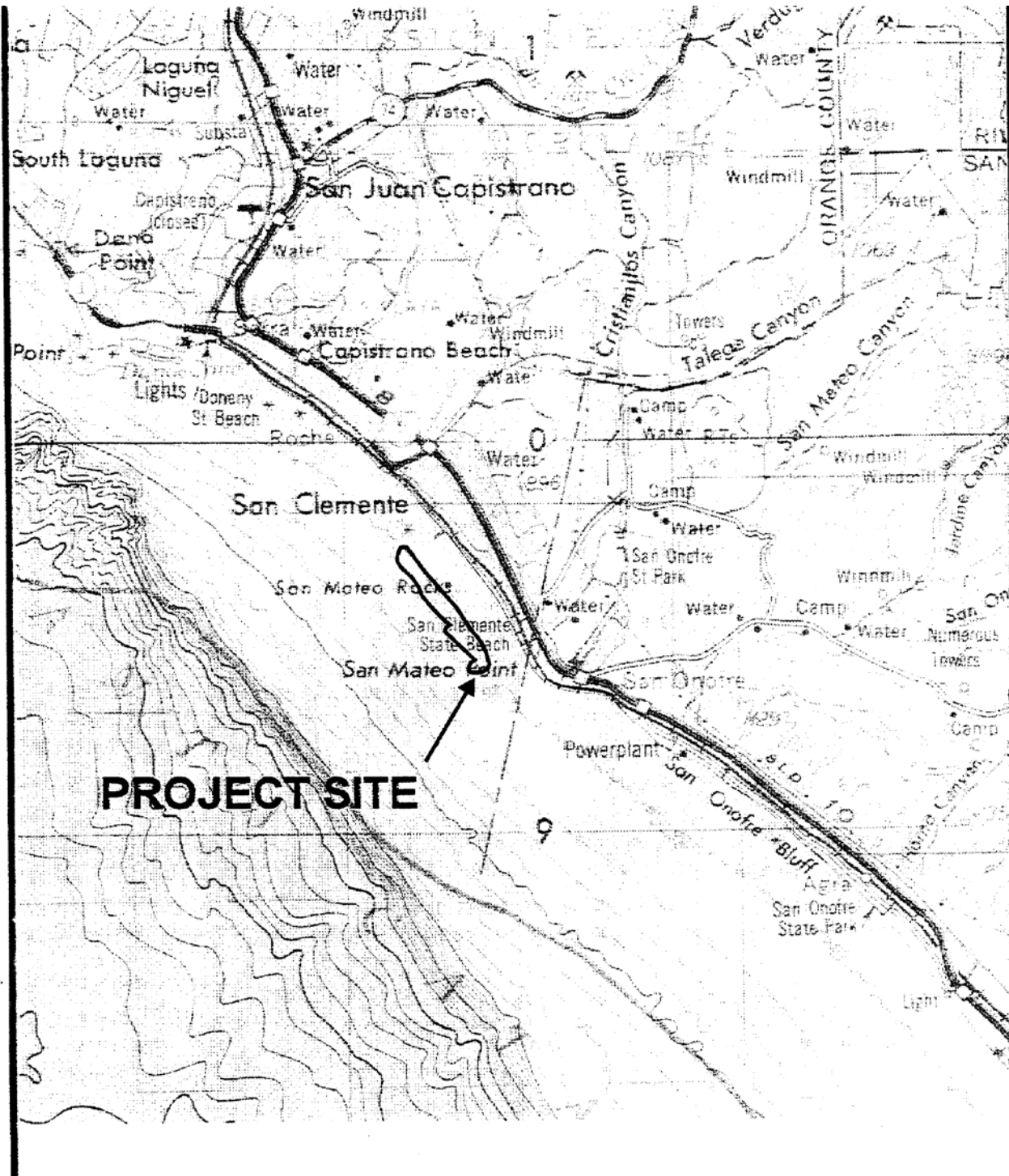
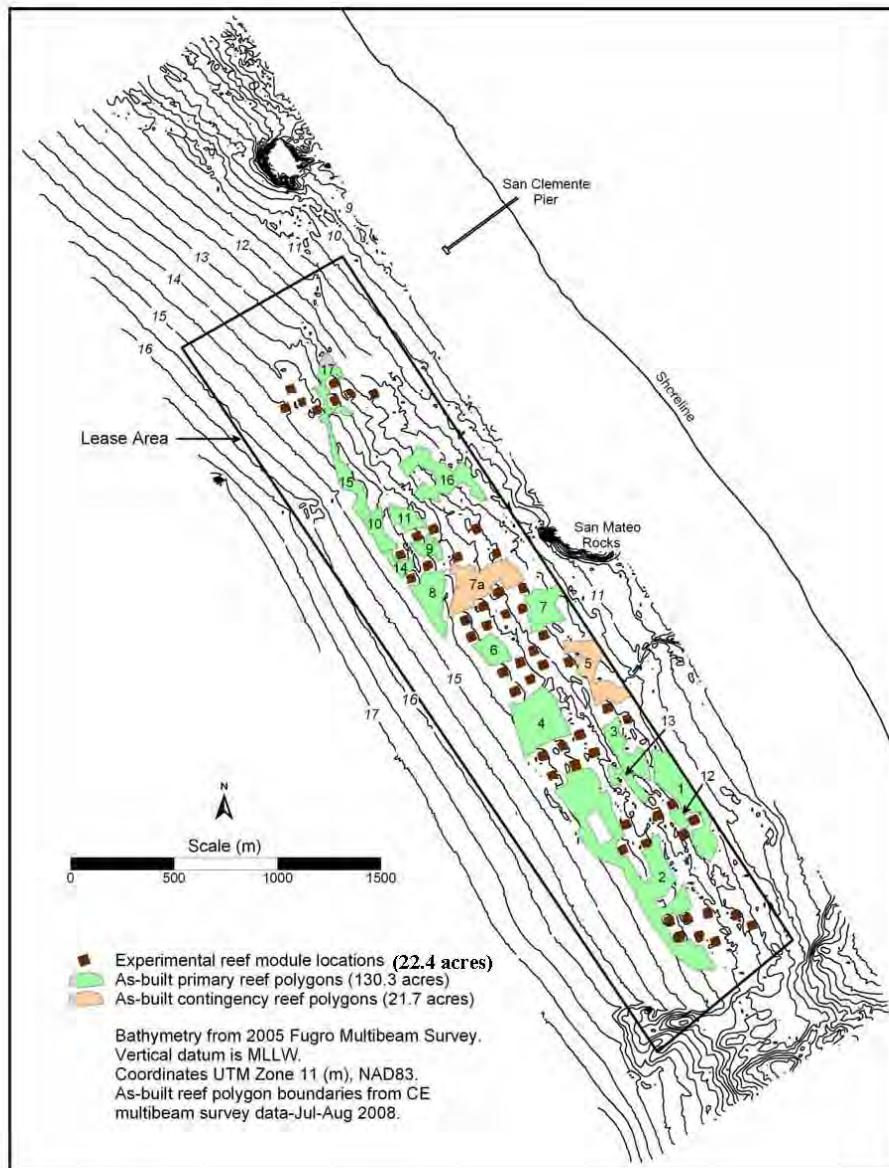


EXHIBIT 3: Mitigation Reef Project Location Map



Phase 1 and 2 Mitigation Reef (WNR), consisting of the experimental modules (dark brown) and primary polygons (green) that combined equal 152.7 acres, approved by the CCC Executive Director as meeting the requirements of SONGS CDP #'s 6-81-330-A and E-07-010.

EXHIBIT 4: Mitigation Reef



September 17, 2015

Ms. Susan M. Hansch, Chief Deputy Director
Energy and Ocean Resources
California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, CA 94105-2219

Dear Ms. Hansch:

SUBJECT: SONGS Mitigation Program:
2016 - 2017 Two-Year Work Program and Budget

Southern California Edison (SCE) has reviewed the draft work program and budget for the SONGS Mitigation Program and supports your request for its approval by the Coastal Commission.

The draft reflects our recent discussions. SCE appreciates your efforts to help us contain the costs of Coastal Commission oversight and monitoring of the mitigation projects as required by our Coastal Development Permit. We also appreciate your efforts to clearly articulate the specific tasks to be undertaken by your contract scientists, the justification for those tasks, and the estimated costs of each.

In total, the proposed work program will cost SCE and the other SONGS owners over \$5.8 million over the next two years. However, I am hopeful that continued collaboration between our respective team members will further economize the work program as it progresses.

Please call me at (626) 462-2589 if you should have any questions.

Sincerely,

A handwritten signature in cursive script that reads "Tracey Alsobrook".

Tracey Alsobrook
Project Manager

cc: Kate Huckelbridge
David Kay, SCE
Wendy Miller, SCE

EXHIBIT 5: SCE Support Letter